AUGUST 30, 1954

NEWS ISSUE

Electrical World

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MEETINGS CALENDAR

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Fall Meeting, Schroeder Hotel, Milwaukee, Sept. 8-10; Annual Meeting, Statler Hotel, New York, Nov. 28-Dec. 3.

PENNSYLVANIA ELECTRIC ASSOCIATION

47th Annual Meeting and Business Conference, William Penn Hotel, Pittsburgh, Sept. 14-15; Fall Meeting, Systems Operation Committee, Alexander Hotel, Hagerstown, Md., Oct. 7-8; Fall Meeting, Relay Committee, Hotel Alexander, Hagerstown, Md., Oct. 14-15; Fall Meeting, Electrical Equipment Committee, Hotel Robert Treat, Newark, N. J., Oct. 19-20.

EDISON ELECTRIC INSTITUTE

Accident Prevention Committee, Benjamin Franklin Hotel, Philadelphia, Sept. 20-21; Industrial Relations Committee, Round Table Conference, Palmer House, Chicago, Sept. 27-29; Meter and Service Committee, Leland Hotel, Springfield, Ill., Sept. 27-29; EEI-AGA Tax Committee, Brown Palace Hotel, Denver, Colo., Sept. 29-Oct. 1; Prime Movers Committee, De Witt Clinton Hotel, Albany, N. Y., Oct. 4-5; Area Development Workshop, Hotel Statler, Cleveland, Ohio, Oct. 7-8; Transmission and Distribution Committee, Sir Francis Drake Hotel, San Francisco, Calif., Oct. 7-8; Electrical Equipment Committee, Hotel Statler, Hartford, Conn., Oct. 11-12; Industrial Relations Committee, in conjunction with North Central Electrical Association, Minneapolis, Minn., Nov. 18-19; Prime Movers Committee, Astor Hotel, New York, Nov. 29-30; Sales Conference, Edgewater Beach Hotel, Chicago, March 28-31, 1955; Annual Convention, Statler-Biltmore Hotels, Los Angeles, June 13-16, 1955.

SOUTHEASTERN ELECTRIC EXCHANGE

Engineering and Operation Section, Thomas Jefferson Hotel, Birmingham, Ala., Sept. 23-24; Accounting Section, Roanoke Hotel, Roanoke, Va., Oct. 21-22; General Sales Conference, Roosevelt Hotel, New Orleans, La., Oct. 28-30; Accident Prevention Committee, Heidelberg Hotel, Baton Rouge, La., Nov. 11-12; Annual Meeting, Boca Raton Hotel and Club, Boca Raton, Fla., Mar. 21-23, 1955; Engineering and Operation Section, Roosevelt Hotel, New Orleans, La., April 7-8, 1955.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

Committee on Petroleum, Conference on Electrical Applications in Petroleum Industry, Mayo Hotel, Tulsa, Okla., Sept. 27-29; Middle Eastern District Meeting, Abraham Lincoln Hotel, Reading, Pa., Oct. 5-7; Fall General Meeting, Morrison Hotel, Chicago, Oct. 11-15; Winter General Meeting, Hotel Statler, New York, Jan. 31-Feb. 4, 1955.

PUBLIC INFORMATION PROGRAM

Workshop Conference, Chase and Park Plaza Hotels, St. Louis, Oct. 27-29.

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

Annual Meeting, Haddon Hall Hotel, Atlantic City, N. J., Nov. 8-11; Winter Meeting, March 7-11; 1955.

AMERICAN POWER CONFERENCE

17th Annual Meeting, Sherman Hotel, Chicago, March 30-31, April 1, 1955.

MEMO FROM
THE EDITOR

Dear Reader:

For your information here is the Meetings Calendar listing the major industry meetings for the coming months. You will want this particularly at this time to schedule your trips and those of your associates.

As you know this Electrical World service appears in every issue.

Sincerely

J.B.

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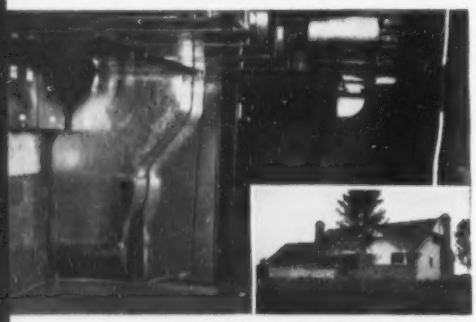
For other meetings see page 60

NEW HOME INSTALLATIONS of G-E Weathertrons provide utilities with chance to join G.E. in accurately predicting future home use, as discussed by G.E.'s P. F. O'Neill, Mgr., Utility Contacts, Weathertron Dept., and H. M. Brundage, General Manager, Weathertron Dept. For information on a metering program in your area, write General Electric Co., Section 301-230, Schenectady 5, N. Y.

Weathertron metering program can spell out

A new pattern for tomorrow's residential loads



IN CANTON, OHIO, one of many northern installations, growing popularity of heat pump underscores need to re-evaluate residential usage.

IN BIRMINGHAM, ALA., as elsewhere in the South, metering of this heat pump shows winter heating consumption helping to balance summer cooling demands.

Now specific data on system performance, kw demands can help extend range of greatest home load builder to many new areas

Now that many electric utilities are metering and analyzing actual home installations of General Electric Weathertrons—a program outlined by G.E., an answer is shaping up to the question: What will tomorrow's residential loads be?

ACCURATE FORECASTING OF LOAD CHARACTERISTICS

Based on recording demand metering of many heat pumps, power consumption forecasts based on continuing the present growth rate take on a new significance. While heat pumps have already become popular in some regions, following the acceptance of room coolers and central air conditioning, their inherent year-round load characteristics can bring benefits to utilities in almost every area. Installations in Ohio are being metered right now and additional units and metering programs are under way or being planned for many other areas. These studies will give utilities factual information on serving Weathertron homes in their areas and thus broaden the base for future load growth.

GROUNDWORK FOR DISTRIBUTION SYSTEM PLANNING

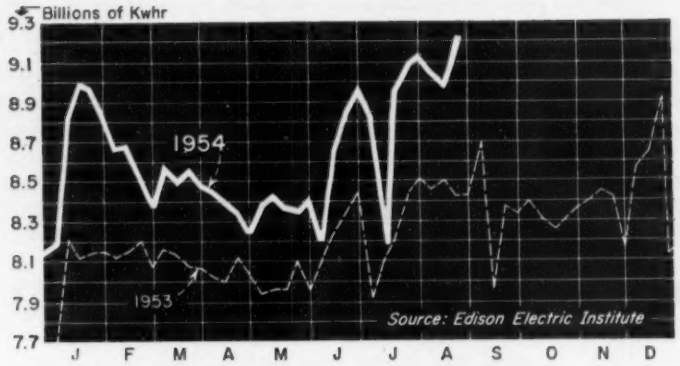
For areas where the Weathertron is now being used and in new areas where data is being weighed, G-E electric utility application engineers are translating the latest information to the optimum design of residential distribution systems. For utilities, growing acceptance of the heat pump coupled with G-E application engineering services opens a tremendous new field for load growth. General Electric Co., Apparatus Sales Division, Schenectady 5, N. Y. 301-230

MORE POWER TO AMERICA

GENERAL ELECTRIC

Electrical World

August 30, 1954 Vol. 142, No. 9



Output Week Ended Aug 21—9,207,000,000 Kwhr

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Aug. 21	+9.2	+1.8	+2.8	+0.7	+11.3	+20.4	+24.5	+1.8	+2.8	+2.4
Aug. 14	+5.7	−0.4	−0.2	−4.2	+5.1	+17.4	+14.5	+4.7	+1.9	+3.1
Aug. 7	+7.0	+1.6	+3.6	−3.9	+5.9	+17.6	+14.9	+5.6	+1.8	+6.9

Seasonally Adjusted Index† 176.7 Week Ago 173.5 Year Ago 161.8

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load‡ (Million Kw)	June	78.0	73.8	73.0
Capacity (Million Kw)	June	95.31	93.81	85.06
Production (Billion Kwhr)	June	38.90	37.43	36.98
Hydro	June	9.59	10.35	9.10
Fuel	June	29.31	27.08	27.88
Fuel Consumption				
Coal (Million Tons)	June	9.29	8.67	9.07
Oil (Million Barrels)	June	4.29	4.25	6.11
Gas (Billion Cu Ft)	June	107.79	94.70	103.73
Sales (Billion Kwhr)	June	32.57	31.59	31.77
Residential	June	9.32	9.31	8.37
Commercial	June	6.04	5.62	5.46
Industrial	June	14.85	14.43	15.80
Other	June	2.36	2.23	2.14
Net Income Class A & B Companies ($ Million)	May	85.46	96.05	82.58
Estimated Dec. '54 Peak ‡(Million Kw)	May	88.1	88.4	91.8
Kwhr per Residential Customer (12 Month Average)	May	2,427	2,415	2,241
Revenue per Kwhr Residential Service (12 Month Average)	May	2.72¢	2.72¢	2.76¢
Canadian Production (Billion Kwhr)	May	5.93	5.65	5.76

Business Statistics

FRB Industrial Production Index†	July	117*	124	129
Gross National Product Annual Rate ($ Billion)	2nd Qtr.	356.0	355.8	369.9
EW 5 Industry Production Index†	May	114.9	114.6	126.2
ENR Construction Cost Index††	July	135.0	130.5	126.6
BLS Consumer's Price Index	June	115.1	115.0	114.5
NEMA Insulation Materials Sales Index†	June	124	116	174
NEMA Electric Appliance Sales Index†	June	102	89**	105
NEMA Household Refrig. Sales Index†	June	82	74	88

*Preliminary **Revised ‡Class 1 Systems †1947-49=100 ††1949=100

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When cemented to caps, top and bottom, this porcelain becomes what is probably the strongest switch-and-bus insulator ever produced.

Illustrated in the production of this unit is a noteworthy and valuable characteristic of the Lapp Post design. The simplicity of the structure, the uniform reliability of Lapp porcelain, and the certainty of cemented caps, instead of pins or inserts, all are such that it is routinely possible to design an insulator into an unexplored strength field. And it will meet specified characteristics, without risk of unknown variables.

In this case, specified cantilever strength requirement was 10,000 pounds. Because time was short, we designed for a generous factor of safety—and obtained all of it. The porcelain is 11½" diameter, 13⅜" high, and weighs a little over 60 pounds. It is, of course, the traditional Lapp Station Post closed end porcelain, with integral top diaphragm.

HOW MUCH STRENGTH DO YOU NEED IN A SWITCH-AND-BUS INSULATOR?

In the Lapp plant, such porcelains as this are almost commonplace. Everywhere you look you will see pieces with the characteristic Post corrugations, in all stages of production, and in sizes for duty over a wide range of voltages and strengths. And every unit will be proved, through extensive testing facilities, to its specification requirements. No where else will you find such emphasis, such devotion, to "difficult" porcelains.

Users of Lapp porcelain—as components of electrical equipment, or as insulators for transmission or station duty—profit, in security, in long life, in low upkeep, from the experience and skill born of such design and production.

Lapp Insulator Co., Inc., Le Roy, N. Y.

THE ELECTRICAL WEEK

The Issue's News Highlights . . . Philadelphia Electric has announced plans to install a 275,000-kw, 5,000-psi, 1,200F super-pressure turbine generator and boiler at a new station to be erected on a site net yet determined.

Joint Atomic Energy Committee will hold hearings Sept. 2 to determine whether a waiver should be granted to dispense with 30-day study of the Dixon-Yates plan while Congress is in session.

Commissioners of Grant County PUD have rejected offer to join Washington State Power Commission in application for preliminary permit to study Priest Rapids. PUD said the joint action might jeopardize its application because WSPC authority has not been tested in court.

New interim amendment to National Electric Code on grounding and wiring standards for air conditioners provides: Conditioner's exposed metal parts which might become energized must be grounded, and conditioner load on branch circuit cannot exceed 50 to 80% depending on other loads on circuit.

Pacific Northwest Governor's Power Policy Committee's engineering subcommittee reported that fishery conflicts may impede construction at dams which would provide half the power needed by 1969.

AEC permission was asked by World Steel Corp to use a nuclear reactor in a proposed new plant, near Chicago, for power generation.

Electrical World's estimate of 467 billion kwhr for 1954 Class 1 output indicates industry-wide generation of 469 billion kwhr, compared to 476 billion kwhr average guesstimate made by Bob Hatfield's 1954 Kwhr Power Generation Pool.

Strikes at Anaconda Copper Mining Co and its subsidiary American Brass Co have affected 10,000 workers in Montana and Idaho and 3,600 workers in New York and Connecticut. Union was asking 25¢ an hour plus other benefits. Anaconda offered to continue present contract, and American Brass is reported to have offered 3¢.

Southern California Edison Co was granted a $9.8-million electric rate increase, its first in 33 years. Company requested $18.6-million.

First residential electric rate increase in Connecticut Power Co's history has been granted. The $1.1-million rise will yield 5.8%. Company requested $1.6-million hike.

Second supplement to PIP Atomic Energy Information Kit, issued last week, points up importance of new atomic energy law to electric industry.

Off the Washington Wire . . . From his Denver summer office, President Eisenhower will participate in groundbreaking ceremonies for the nation's first utility-size atomic power plant Sept. 6. By remote control, he will set off drilling machinery to break ground at the Shippingport, Pa., site where Duquesne Light Co and Westinghouse Electric Corp will build the 60,000-kw plant.

National Planning Association will undertake a $200,000 study into peacetime uses of atomic energy. Funds are to come from the Ford Foundation by way of Resources for the Future, Inc.

Congress failed to clear legislation which would permit sale of the federally owned Parker-Davis transmission facilities in Arizona and California to public bodies in those two states. Also by-passed in the last-minute rush was the Missouri Basin compact bill.

FPC has issued a preliminary permit to the Pacific Northwest Power Co, consisting of four large electric companies, for a two-dam project on the north and middle forks of the Clearwater River in Idaho. The North Fork Dam, called the Bruces Eddy development, would have an installed capacity of 244,000 kw. The other development, designated Penny Cliffs, would have an installed capacity of 292,000 kw.

Reclamation Bureau is studying the possibility of a local-federal partnership arrangement in connection with power development at the $216-million Trinity River Project in northern California.

Montana Power Co has asked FPC for preliminary permits for two proposed waterpower projects on the Flathead River in Montana. The projects would have an installed capacity of 120,000 kw each.

Reynolds Metals Co construction of an all British Columbia aluminum plant comparable to Kitimat as part of Northwest Power Industries' $700-million hydro and metallurgical project looms as outcome of top level conferences in Victoria.

Executive Changes . . . Vepco elected M. C. Smith executive vice president to succeed W. E. Wood, retired. Erwin H. Will replaces Smith as vice president and general manager . . . Charles F. Monnier was appointed vice president in charge of operations of Niagara Mohawk Power Corp.

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275,000-Kw, 5,000-Psi Unit Announced

Philadelphia Electric Co reveals plans to install the largest single-shaft machine yet ordered in the world's most efficient power station. Steam will be at 5,000 psi, 1,200F with two stages of reheat at 1,050F. Westinghouse Electric Corp and Combustion Engineering, Inc, will supply the equipment. Station site will be determined later

Philadelphia Electric Co today announced that it plans to build the world's most efficient power station, using a 275,000-kw, super-pressure turbine generator unit, largest single-shaft machine yet ordered. The unit will operate on steam at 5,000 psi, 1,200F, highest pressure and temperature ever projected. The two stages of reheat will be at 1,050F.

In making the announcement, Pres R. G. Rincliffe, said the new plant, representing an initial investment of some $45 million, will be located on a site yet to be determined.

"The new plant," he said, "will add more than 10% to the generating capacity of Philadelphia Electric. This expansion is part of the company's long-range plan to keep ahead of electric demands in the rapidly growing Delaware Valley."

The 275,000-kw turbine generator unit will be built by Westinghouse Electric Corp, the steam generator by Combustion Engineering, Inc.

Heat Rate, 8,400 Btu/Kwhr

In discussing the unique engineering features of the unit, K. M. Irwin, vice president in charge of engineering, said the expected plant heat rate for steam conditions of 5,000 psi, 1,150F, —at which the plant will operate initially—is 8,400 Btu per kwhr. This is some 600 Btu less than the rate for the most efficient existing station, he asserted.

The tandem-compound, 4-cylinder turbine will operate at 3,600 rpm using triple-flow exhaust to the condenser. Except for the super-pressure element, all elements of the turbine are of conventional design using ferritic materials.

The super-pressure element will be designed for initial steam conditions of 5,000 psi and 1,200F, exhausting at approximately 2,400 psi. The second element combines both high-pressure and first reheat-pressure turbines in a common casing. The third element combines intermediate pressure and single-flow, low-pressure turbines in one casing. The final element is a conventional double-flow, low-pressure turbine exhausting to the condenser at 1.5 in. Hg absolute pressure.

Steam will be condensed in a 105,000-sq ft, single-pass, radial-flow Westinghouse condenser supplied with cooling water by two 75,000-gpm pumps. Nine stages of feedwater heating are contemplated, giving a temperature of approximately 565F boiler feed supply. Westinghouse will supply feedwater heaters totaling 31,000 sq ft.

Generator Inner Cooled

The generator will be rated 352,000 kva, 3-phase, 24,000 v, 3,600 rpm.

It will employ hydrogen inner-cooling of rotor and stator conductors with hydrogen at 45 psi. Separate motor-driven dc generators will provide excitation for the main generator. Magnetic amplifiers will be used to regulate generator terminal voltage.

The boiler is to be a C-E Sulzer Monotube steam generator of the once-through type employing the forced-circulation principle. It will be a twin furnace design with tangential firing. Reheat steam temperature control will be by tilting burners. Arrangement corresponds to that used in many large burners designed by Combustion for utility service. It marks a natural evolution of design to meet requirements of super-critical pressure. The furnace will burn about 100 tons of pulverized coal an hour, at full capacity.

Maximum design steam conditions for the boiler are 6,000 psi and 1,200F. At rated load primary steam flow will be 1,540,000 lb per hour. In the first stage of reheat 1,050-psi steam will be reheated to 1,050F. Conditions for the second stage of reheat will be 250 psi, 1,050F.

More than 65% of the total heat transferred in the boiler will be absorbed in the superheater and the two reheaters. To accomplish this, radiant-wall superheating surface will supplement the conventional superheater and reheater sections. Three regenerative-type air preheaters are to be installed.

Swiss Patents Used

Conventional combustion controls will be employed to meter fuel and air in proportion to steam demand. For control of steam and water flow and temperature, in the steam generating unit, C-E Sulzer automatic controls of oil hydraulic type will be used.

American license right to Sulzer designs and patents were acquired last year by Combustion from Sulzer Brothers, Ltd., Winterthur, Switzerland. Sulzer Brothers developed this type of boiler some years ago and has manufactured a large number of them for high-pressure installations in Europe.

Work on the equipment for the new plant will start at once. Construction is expected to take approximately three years.

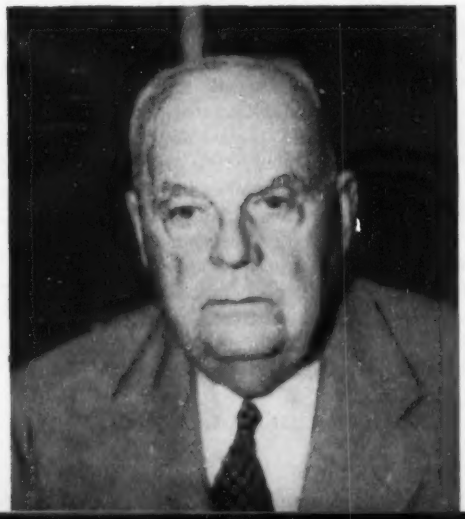
In addition to the plant just announced Philadelphia Electric has under construction the $57-million Cromby Station on the Schuylkill River near Phoenixville, Recently a 150,000-kw unit was put on the line at this plant (EW, Aug. 16, p 9). A second unit of 200,000 kw capacity is scheduled for completion next year. Including Cromby's first unit, Philadelphia Electric now has a capacity exceeding 2 million kw.

The Philadelphia area has been the center of rapid industrial expansion as the result of the utility's nationwide promotional activities.

GOP 'scandal', 'raw deal' said Mitchell

of contract being negotiated by Dixon,

Yates to supply the Memphis area



DIXON-YATES PLAN FACES NEW CONGRESSIONAL TEST

The Dixon-Yates proposal for selling some 650,000 kw of power to the Atomic Energy Commission faces another Congressional test this week, still the center of a political tempest.

AEC has asked Congress to waive the requirement that the contract be submitted for a 30-day study while Congress is in session. The Joint Congressional Committee on Atomic Energy, which can grant the waiver, called on AEC, Federal Power Commission and the Attorney General to submit statements regarding the waiver at open hearings scheduled for Sept. 2.

Unless the committee clears the contract early next month, AEC warns that actual construction of the 650,000-kw plant to be built at West Memphis, Ark., will be held up until next year.

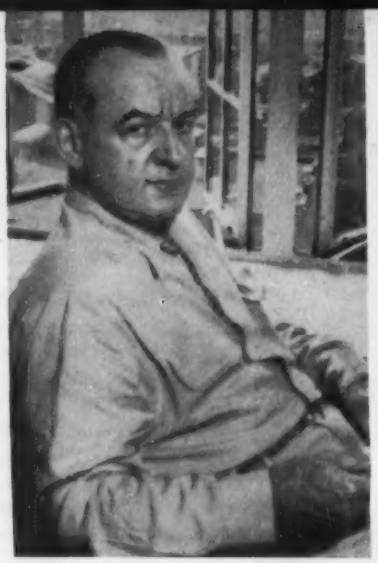
The proposal calls for the West Memphis plant to feed power into the Tennessee Valley Authority system at Memphis, Tenn., replacing power which TVA will deliver to AEC at the Paducah, Ky., gaseous diffusion plant.

The Developments . . . These were other developments:

- At the direction of President Eisenhower, AEC and the Budget Bureau made public most of the government documents relating to the proposal and two chronologies of the negotiations leading to the still unsigned contract.
- Democratic National Chairman Stephen A. Mitchell, who had precipitated the latest round of controversy on the proposal (EW, Aug. 23, p 97), said press summaries of the AEC-Budget Bureau documents confirmed his earlier charges—"that the deal has been shot through with favoritism by the government to a particular group of private businessmen and on a multi-million dollar scale."
- Republican National Chairman Leonard Hall countered that the Mitchell charges were "baseless insinuations" against the President.
- Mitchell has accepted an invitation from Congressional Joint Committee Chairman W. Sterling Cole (R.-N. Y.) to attend the committee meeting and "present personally any evidence of malfeasance or impropriety" he may have in connection with the Dixon-Yates deal.
- Walter von Tresckow, New York financial consultant who had unsuccessfully offered a competitive proposal, said lack of cooperation between AEC and TVA "is costing the taxpayers of the United States $150 million."
- Chairman William Langer, of the Senate anti-monopoly subcommittee, a North Dakota Republican, threatened to take on private law cases in an effort to raise money to investigate the Dixon-Yates proposal after the Senate refused to allow him $35,000 for the probe.

The near-final form of the contract which went to the Joint Congressional Committee for approval still lacked concurrence of TVA, which would be a party to the contract. AEC General Manager K. D. Nichols, however, requested the committee to "consider the proposed contract as being essentially in final form." This request was seconded by the Budget Bureau, which said the contract "is in compliance with the instruction of the President."

'We were treated as interlopers,' declared Von Tresckow, who offered competing plan



The Dixon-Yates combine, now chartered in Arkansas as the Mississippi Valley Generating Co, would build a $107-million plant at West Memphis, Ark.

Rates . . . Rates, exclusive of taxes, would include a base annual charge of $14.63½ per kw-year subject to variation up or down in case of increase or decrease in actual cost of construction as compared with the present estimate, with a maximum increase of 47½ ¢ per kw-year. The base energy charge is 1.863 mills per kwhr, which is an estimated cost.

Budget Director Rowland Hughes describes the contract as "essentially an interchange of power in kind between AEC and TVA."

Several Democrats on Atomic Energy Committee expressed reluctance to clear the contract immediately. Democratic Sen Clinton Anderson of New Mexico said many committee members would be absent from the hearings later this week. However, Chairman Cole said members would be polled on the contract even if they were not in Washington.

The 134 pages of government documents relating to the Dixon-Yates proposal brought to light numerous letters from electric utility executives and government officials regarding the philosophy behind the proposed contract. There was no hint of under-the-table deals in the day-by-day chronology of the negotiations detailed in the documents.

These documents show that former TVA Chairman Gordon Clapp made several attempts to sidetrack the "no new starts" policy which the Budget Bureau applied to TVA power expansion. Letters from the two other TVA board members urged that the policy leading to the Dixon-Yates proposals be reconsidered.

The AEC-Budget Bureau documents indicate that the idea of bringing additional private power to the AEC Paducah, Ky., plant, replacing TVA power, was first broached by former Budget Director Joseph M. Dodge at a meeting with AEC officials Dec. 2, 1953.

Walter J. Williams, former deputy general manager of AEC, agreed to discuss the possibility with J. W. McAfee, president of both Union Electric Co of Missouri and Electric Energy, Inc, which will serve a portion of AEC's Paducah requirements.

McAfee made several observations on the Dodge idea in letters to Williams. The electric company executive said that a group of private investors could be formed to submit a proposal for supplying a large block of power to AEC. However, McAfee said it would not be desirable to put further capacity at the site of the Joppa plant of EEI.

McAfee's Suggestions . . . In a later letter, McAfee offered two additional suggestions for relieving the national budget of avoidable capital expenditures in the TVA area:

- "That TVA no longer assume full responsibility for supplying all the needs of municipalities. Thus, as present contracts expire, those municipalities which need a greater supply than is available from the authority would be obliged to arrange for purchase from others or for the construction of a plant with municipal funds.
- "Arrangements with neighboring companies of TVA to sell power to the authority. I am confident that arrangements could be made for the construction of a new plant if that is necessary."

After discussions with other persons in the electric utility industry, McAfee found that Dixon was interested in submitting a proposal of the type sought by AEC and the Budget Bureau. The government documents show that Dixon had previously offered to supply a sizable block of power to TVA, as had Southern Co.

Thus Dixon and Yates teamed up to submit a general proposal to supply AEC power by way of the TVA system. This was received by AEC Feb. 25 and analyzed by AEC, the Budget Bureau, and two FPC engineers.

A number of proposed revisions in the Dixon-Yates offer grew out of these studies and a revised offer was submitted to AEC April 12. TVA was brought into the studies at this point and helped prepare a joint analysis of the revised proposal in comparison to the costs of a TVA power plant.

At this point, too, AEC Commissioners Henry D. Smyth and Eugene Zuckert protested about AEC becoming involved in a private power contract. Commissioner Thomas E. Murray also expressed disapproval of the plan.

On April 28, a group headed by von Tresckow first notified AEC that it desired to submit a proposal in competition to the one offered by Dixon-Yates. It named Gibbs & Hill, Inc, of New York as engineering firm for the von Tresckow group. When AEC determined that the engineering firm would not act for the group it cancelled an appointment which it had earlier scheduled with von Tresckow, but on May 27, it did receive the von Tresckow proposal. AEC, Budget Bureau, and TVA discussed this offer between May 27 and June 17.

In commenting on its relations with AEC, the von Tresckow group, in a recently issued six-page statement, said it was granted "only one meeting with commission personnel."

It added: "We still have not received a detail of their analysis of our proposal, which we were promised."

The syndicate declared that "the facts are that there has been no friendly cooperation by the AEC with us. We were treated as interlopers by the AEC in a well-set program to do business with Dixon-Yates. . . . "

Jewel-Studded Bulb Glitters for Jubilee

To honor Thomas Edison's invention in 1879 of the first commercial incandescent lamp, Commonwealth Edison Co has placed in operation at its headquarters building in Chicago the illuminated sign shown above. This specially designed spectacular lamp consists of a revolving light bulb 12 ft high and 6 ft in diameter. The bulb is covered with a myriad of small mirrors each 2 in. sq. Lights play on the lamp as it revolves, giving the appearance of a jewel-studded bulb. It will operate throughout 1954 from 7 a. m. to midnight each day.

Spillway Torrents Suck 5 Men to Their Deaths

Bonneville dam spillway flow snatched five men to their deaths and tore apart a 47-ft tug and an 80-ft barge of the Larson Construction Co Aug. 20. The crew was preparing to anchor below the Columbia River structure and conduct soundings for a cofferdam to allow repair and restoration of baffles on the south portion of the hydro power dam.

A lone survivor, Henry Coles, told Army Corps of Engineers board the tug was moving the barge toward the face of the spillway sector, from which flow had been closed off, when the barge was sucked toward the torrent pouring through gate No. 8. Coles managed to cut all but one rope linking the barge to the tug before the water smashed onto the barge and immediately pulled the tug in under.

Dead were Merle L. Tobias, 49, Portland engineer in charge of the crew and a veteran of varied construction jobs around the world; George W. Graham, Kalama, Wash.; Magnor Larsen, 66, Astoria operator of the tug; L. L. Boycan, Cathlamet, Wash.; and Donald A. Lewis, 20, an Oregon State College engineering junior and son of Frank Lewis, former resident engineer at Bonneville project for the corps.

Larson Construction Co of Astoria, Ore., had recently been awarded a $678,150 contract for repair of the baffles, the first such major repair on the 15-year old Columbia River structure. Corps had closed down 8 of the 16 main bays to create a quiet pool for the operation. In reconstructing the event later, observers indicated the tug operator had pushed the barge just past the point where it was to be anchored and a powerful eddy sucked it sidewards and forward into the spillway torrent.

Dam Funds Voted

Congress provides $600,000 for planning on Priest Rapids, Cougar, Markham Ferry

The Army Corps of Engineers has $600,000 with which to begin planning on three large western water power projects, two of which have been authorized by Congress as local-federal partnership ventures.

Funds for initial planning were appropriated in the final days of the session. The total is divided: $350,000 for planning of the $364-million Priest Rapids, Wash., multipurpose project; $150,000 for the $37.4-million Cougar Dam, Ore., project; and $100,000 for $40-million Markham Ferry, Okla., facilities.

Cougar Bill Dies . . . Bills have been passed to authorize federal-local partnership in building the Priest Rapids and Markham Ferry projects, but legislation for such an approach to Cougar Dam construction died in the Senate as a result of the rush for adjournment.

These are the only ones for which actual cash has been laid out. Priest Rapids and Markham Ferry were authorized before this session, but no funds for construction have yet been appropriated. The Cougar Dam project was included in this year's version of the omnibus rivers and harbors flood control bill which has just become law.

New Authorizations . . . All other power projects authorized in this year's omnibus bill, and their estimated construction costs, are: Lower Cumberland (Tenn.-Ky.), $161.3 million; Belton (Tex.), $21.5 million; Greers Ferry and Beaver (Ark.), $27 million and $45 million; Green Peter and White Bridge (Ore.-Wash.), $49.7 million and $8.5 million; and Stockton and Pomme de Terre (Mo.-Kan.), $37.7 million and $25.8 million.

IN THE INDUSTRY

Air conditioning loads placed a big drain on distribution transformer stocks down South this summer. Requirements, particularly of the 25, 37½, and 50-kva sizes, were so high that special shipments of carload and even planeload lots were necessary. Some classes of transformers were entirely sold out.

Utilities Give Inventories a Sharp Scrutiny

What does this experience represent in terms of utility and manufacturer inventory requirements? Is there a need to revaluate this important industry problem?

Top Management Interested . . . Utility inventories have been receiving major attention by top management over the past 12 months. The need for this scrutiny of inventories has grown out of the excessive stocks which tended to accumulate during the peak of the construction program and the shortage of materials resulting from the war in Korea.

Purchasing agents have made a supreme effort to analyze their purchasing and stores requirements to reduce the cost of inventories to an absolute minimum. The solution to the problem of maintaining adequate but minimum inventories has been approached from several directions all of which are contributing towards possible long range solutions. But some have inherent dangers.

One utility is centralizing stores locations so as to reduce inventories and stores personnel. Another utility is placing inventories in more locations in order to save traveling time. In still another case, and perhaps many are approaching this point, a utility is doing away with inventories except for emergency stocks.

This latter move ties in with certain utilities' requests for manufacturers to maintain inventories in their area in order to satisfy day-to-day requirements. This in turn is creating a duplication of inventories through the stocking of the utility requirements by several manufacturers for the same area. A slightly different plan is being tried by one utility whereby estimates for six months' requirements are being given to manufacturers with whom they do business in order to maintain minimum inventories but orderly deliveries.

Remedies May Have Dangers . . . All of these attempts on the part of the electric utilities are planned from the constructive point of view of reducing the investment upon which the utility must earn a return. This approach is well taken as long as it works towards over-all economy of supply of equipment and the maintenance of adequate inventories for emergencies. If a program creates duplication of inventories in a particular area, there is serious question whether there is an overall benefit or a substantial loss to the industry as a whole.

If inventories are not sufficient to handle emergencies, such as unusual load growth, war, storm, or similar situations, the gain in dollars may be offset many times by the loss in the primary objective of good service. Situations like the shortage of distribution transformers because of the heavy air conditioning loads are to be expected frequently. To some extent this situation could and probably was foreseen. But it is probable that such knowledge was not always transmitted to the appropriate purchasing and stores executive in sufficient time for him to handle the problems created. It appears urgent that utilities and manufacturers should give more thoughtful study to the problems of adequate inventories to handle potential emergencies and to give maximum service to the utility and the utility customer at minimum cost to the electrical industry as a whole.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Halving the channel spacing for mobile radio doubles the number of potential assignments, but it far from doubles the number of usable channels.

Impedance of iron conduit may be considered practically equal to zero when single-phase current (including faults) is returned on the duct itself.

Two mobile radio channels in the same general area operate on different frequencies. Each channel may nevertheless affect the other because of spurious transmitters, insufficient receiver selectivity, or receiver oscillation radiation.

Submarine cable should be picked up for repair as soon as possible after a fault to minimize entrance of water as the cable cools.

A series capacitor at the receiving end of a long line leaves the voltage at no load there unaffected. Optimum compensation per ohm of capacitance is obtained when the capacitor is at the center of the line.

Sulfur hexafluoride holds superiority over other available gaseous insulations from the angle of dielectric strength, chemical stability, and freedom from condensation at low temperatures.

Division wall in a furnace permits obtaining the required heat absorbing surface with less total furnace width and less total furnace volume than in an undivided furnace.

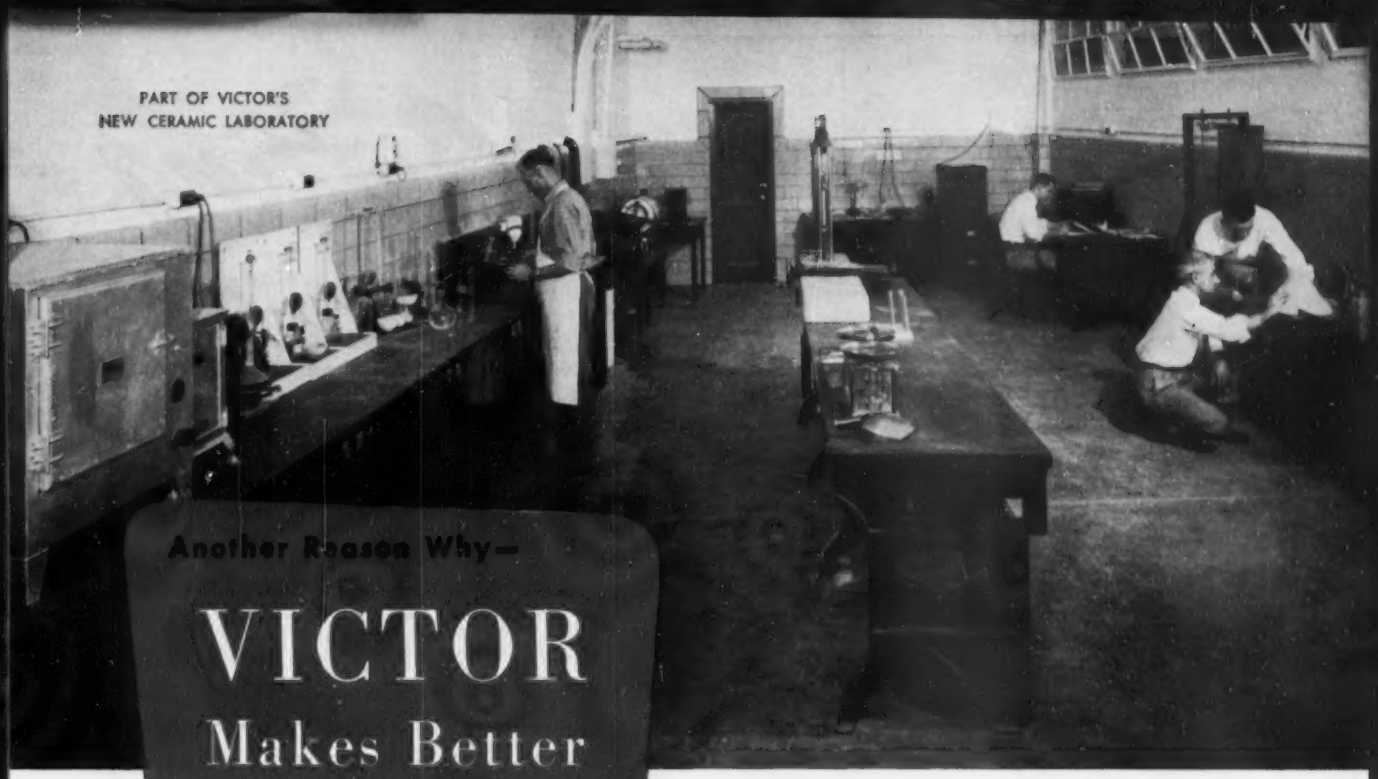
Operators for systems and power plants in general represent an impressive advance in intellectual stature and know-how when compared with predecessors of 30 years back.

Storms accentuate the growth of power transmission systems in extent and loading and further the need for dependable switching to isolate trouble or restore service.

Engineers who design or select controls should probably be held directly responsible for their proper operation. Nor should anyone else authorize changes during installation.

Tripping a generator which has lost its field excitation is not necessary until it is on the point of losing synchronism. It is safe to reapply the field even if the unit is off synchronous speed.

Power plant trash used to be tossed on top of the stoker fire. That cannot be done with a burner-fired boiler; so a trash-burner is necessary.



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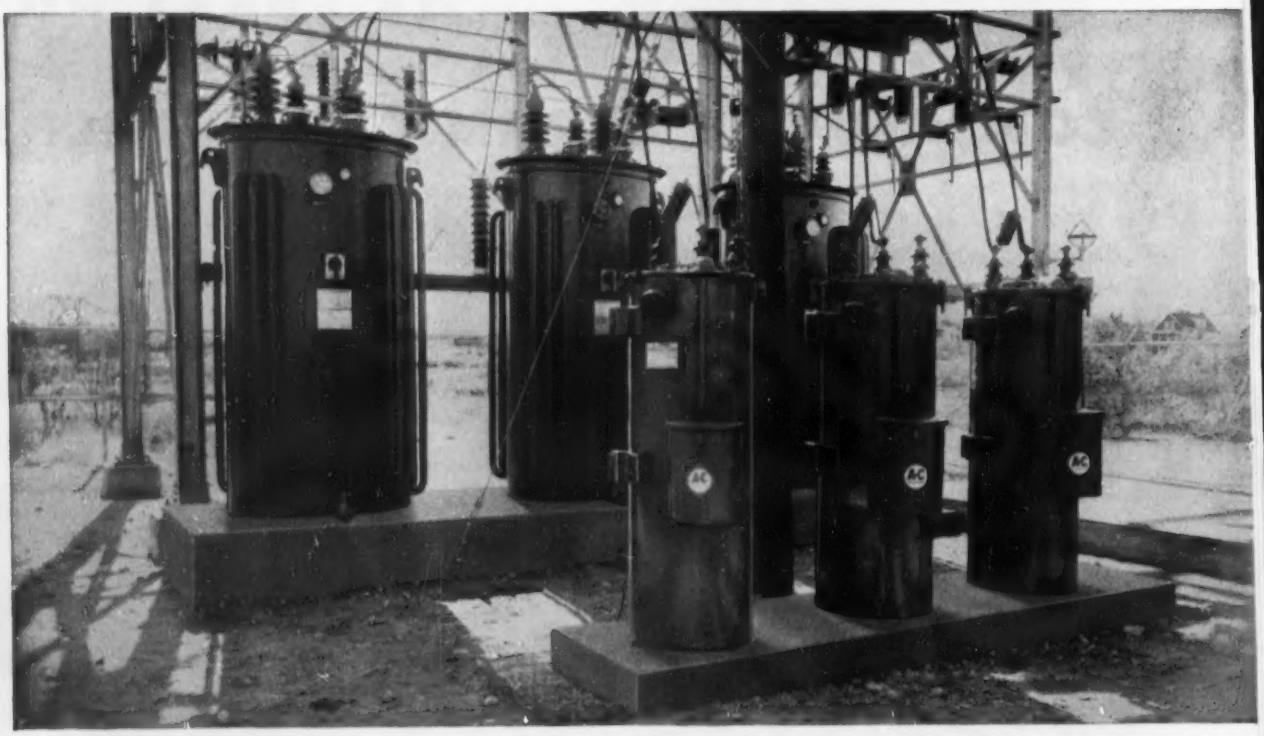
Is Poor Voltage *Cutting*

HERE'S HOW poor voltage cuts into system revenue: if voltage is only 2.5% low on a 1000-kva yearly peak load, revenue drops as much as $600 per year. Ten percent low voltage costs as much as $4500 in revenue. And it's all a direct loss in profits. Return on system investment is far below what you can get with proper voltages. The chart at right tells the complete story for a typical system.

How can you turn this lost revenue into profits? An easy-to-install answer is an Allis-Chalmers distribution regulator. It will not only keep voltage up, it will pay its own way — out of increased revenue — in as little as two years. After that, all increases in revenue are pure profit to your system.

Allis-Chalmers distribution regulators are a particularly wise choice. Twenty years' experience with their rugged, reliable design has proved it. Hundreds of distribution men will tell you from their own experience of their accuracy and reliability.

Field-proved design, rugged construction, and simplified installation and maintenance add up to a regulator that can turn lost revenue into real profits. Get all the facts on Allis-Chalmers distribution regulators. Call your nearby A-C office or write Allis-Chalmers, Milwaukee 1, Wisconsin.



ALLIS-

Your System *Revenue?*

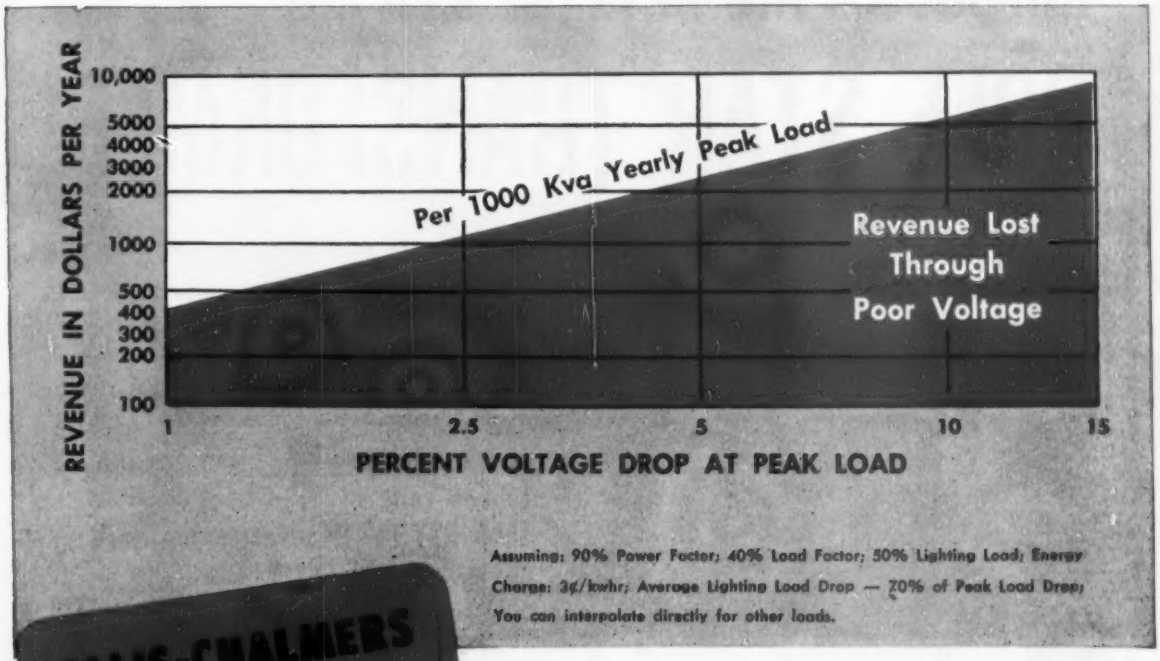


Chart shows revenue losses when voltage is poor on a typical distribution line.

ALLIS-CHALMERS 5/8% STEP VOLTAGE REGULATORS

Field-Proved Mechanism

You get a time-tested mechanism in Allis-Chalmers distribution regulators. For twenty years in thousands of applications this mechanism design has proved itself as the most efficient means of changing taps under load. Laboratory tests show it can withstand over five million operations.

Long-Life Contacts

An important reason why you get satisfactory regulation with a minimum of trouble from A-C distribution regulators is their long-life contacts. Made of arc-resisting materials, contacts are of large size. Laboratory tests prove that they can stand up under the equivalent of forty years of normal operation.

Unit Construction

You get assurance of years of satisfactory service from A-C distribution regulators because of unit construction. All connections are made and thoroughly inspected before tanking — assuring top-quality workmanship. Same feature makes untanking and inspection easy because core, coils, cover, and control form a single unit.

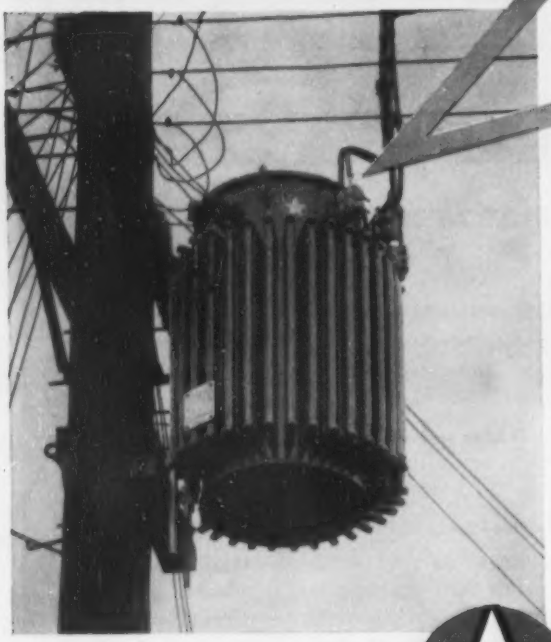
Simplified Maintenance

You don't need highly trained servicemen to handle Allis-Chalmers distribution regulators. Take the control, for example. It is simple. Knobs are calibrated and easy to adjust. If needed, you can remove and replace the entire control merely by pulling a single jack plug — there are no other connections to break.

A-4415

CHALMERS

Pennsylvania Transformer Company introduces the NEW 167 KVA *Feather weight* POLE STAR TRANSFORMER



167 Kva Featherweight Pole Star installed to relieve power shortage in congested business neighborhood. New "featherweight" transformer replaced 100 Kva unit to provide ⅔ additional capacity.

- **Will replace any single phase 75 or 100 Kva Pole-mounted Transformer to provide 67% to 123% more capacity**
- ★ **Weighs less than 1500 pounds**
- ★ **Lower in overall height than average 100 Kva transformer**
- ★ **Available in standard voltages up through 13,200 volts**
- ★ **The FIRST 167 Kva transformer made for direct pole mounting**

Mechanical Characteristics

Weighs less than 1500 pounds.
Conforms to EEI-NEMA Fifth Report except for additional brackets for direct pole mounting.
Overall floor space slightly larger than average for 100 Kva transformers.
Overall height approximately 8" less than industry average for 100 Kva transformers.

Electrical Characteristics

Regulation — Regulation in the new 167 Kva featherweight design compares favorably with that of the regular 167 Kva Pole Star.
Losses — The "featherweight" Pole Star is more efficient up to 60% loading and slightly less efficient above 60% loading.
Exciting Current — Low exciting current found in all Pole Star designs is also inherent in the 167 Kva featherweight design.

UTILITY ENGINEERS ASKED FOR THIS TRANSFORMER

The continuing increased demand for more power is presenting a problem to utility companies serving crowded urban areas. Many power companies with distribution lines located in congested neighborhoods prefer to supply this load through larger-rated pole-mounted transformers rather than resort to more expensive measures, such as underground installations, additional poles for platform mounting, etc.

However, many utility poles in use today are designed to carry a *maximum* of 1500 pounds of transformers. The average weight of all present-day 100 Kva cold-rolled steel transformers — and yesterday's 75 Kva hot-rolled steel transformers — is approximately 1450 pounds. Therefore, 100 Kva is the largest pole-mounted transformer that these poles can carry.

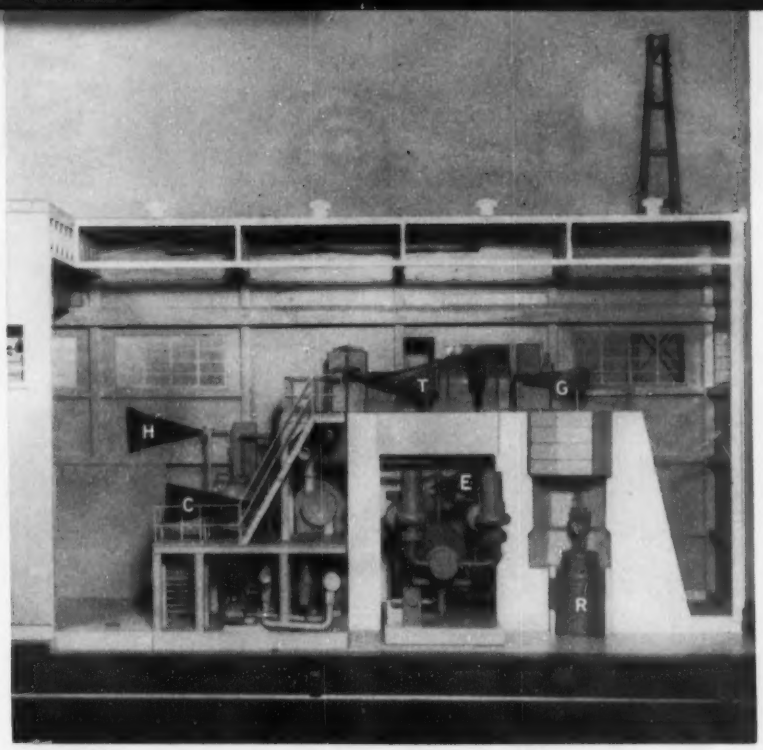
Pennsylvania engineers were advised of this problem and were asked to design a 167 Kva transformer (*the next standard size after 100 Kva*) that weighs less than 1500 pounds. *And that's what Pennsylvania did!* Its answer to this problem is the new 167 Kva featherweight Pole Star.

For further information on Pennsylvania's new 167 Kva Featherweight Pole Star, write, phone or wire your nearest Pennsylvania Sales Representative, or contact

DISTRIBUTION SALES DEPARTMENT

PENNSYLVANIA TRANSFORMER COMPANY

A McGraw Electric Company Division • **Box 330** • **CANONSBURG, PA.** • **Phone Canonsburg 2380**



OPEN HOUSE VIEW of Army's atomic power plant model shows reactor (R) at lower right surrounded by heavy concrete shielding. Water heated by reactor feeds in closed primary loop to adjoining heat exchanger (E). Heat is transferred there to a secondary steam-water loop which feeds to turbine (T) that turns the generator (G). Steam from the turbine is returned to the condenser (C) and water pumped to the feedwater heater (H) for reheating

Bids Asked on Package A-Plant

Requests sent out to 33 companies and groups for tenders on 1,700-kw nuclear plant for use at remote military bases

Army Corps of Engineers is seeking lump-sum bids on the first stationary nuclear power plant designed for use at remote military bases.

Invitations for bids have gone out to 33 U. S. firms which the corps and Atomic Energy Commission have determined are qualified to compete for the prime contract on the 1,700-kw plant which will cost an estimated $4 million.

Site selected for the prototype "package" plant is at the Corps Engineering Center, Fort Belvoir, Va.

Main objective of the nuclear plant project is to develop a generating unit for supplying power to bases where conventional fuels are not easily accessible. Specifications call for the plant to be designed in such a manner that no section of it is too large to be transported by cargo plane.

The idea is to develop a plant which can be shipped by air and assembled over a 30 to 60 day period. Chief advantage is that the fuel elements would last for months and possibly years—thus reducing the logistics burden of supplying conventional fuels in a continuous stream.

Because the plant is keyed to these military objectives, its contributions to the technology of commercially competitive domestic power plants will likely be small.

The "package" plant is to be designed around a "pressurized water" type reactor. This is the same type incorporated in the Navy's first atomic submarine engines, and the same type which is to go into the first utility-size nuclear power plant to be built by Westinghouse Electric Corp and the Duquesne Light Co.

Because simplicity of design is one of the objectives of the "package" project, it is not likely to include many of the cost-cutting refinements to be incorporated in the Westinghouse-Duquesne plant.

Preliminary designs indicate that the Army plant can be housed in a building 29 ft wide, 42 ft high and 80 ft long.

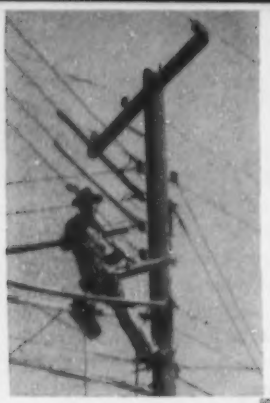
It would operate in this manner:

- Water is circulated through the reactor core at elevated temperature and pressure. The high pressure in system keeps coolant from boiling.
- In the reactor the water slows down the fast neutrons born in the fission process, cools the fuel elements and in the process picks up heat. The water flowing in this closed circuit is brought at a temperature of approximately 450 F, and to a pressure of approximately 12,000 psi.
- From the reactor, the water passes through a heat exchanger where its energy is transferred to the secondary "steam working" loop.
- Water in the steam working loop thus is converted to saturated steam under pressure of 200 psi. Some of the steam can be drawn directly from the line to provide heating; the rest is used to power a conventional turbo-generator set to produce electricity.
- The turbine exhaust is condensed and the water is pumped to the feedwater heater for reheating. It then moves back to the heat exchanger for reconversion to steam.

Bid Invitations . . . Companies invited to submit bids are:

Single companies: Allis-Chalmers Manufacturing Co, American Locomotive Co, American Machine & Foundry Co, W. F. & J. Barnes, Bendix Aviation Corp, Bethlehem Steel Corp (Shipbuilding Division), Blaw-Knox Co, Combustion Engineering, Inc, U. S. Steel Corp (Consolidated Western Steel Division), Fairbanks, Morse & Co, Fluor Corp, Ford Instrument Co, Foster Wheeler Corp, General Electric Co, Kaiser Engineers, Walter Kidde & Co, Inc, Kuljian Corp, A. B. Little Co, Inc, Avco Manufacturing Co (Lycoming Division), Glenn L. Martin, Merritt-Chapman & Scott Corp, Newport News Shipbuilding & Dry Dock Co, North American Aviation, Inc, Ralph M. Parsons, Raymond Concrete Pile Co, Stearn-Roger Manufacturing Co, M. H. Treadwell Co, Westinghouse Air Brake Co, Westinghouse Electric Corp, and Curtiss-Wright Corp.

Joint groups: Babcock & Wilcox Co, Vitro Corp of America; Donovan Construction Co, Winston Brothers Co, C. F. Lytle Co, Green Construction Co, Missouri Valley Constructors, Inc; Sverdrup & Parcel, Food Machinery & Chemical Corp.



Same Lineman, Different Pole

He works for California Electric Power Co, which provides free vacation cabins for its employees near its mountain hydro projects

ROGER MARRON and his family arrived at the cabin after a 275-mile drive up the Sierra

At California Electric Power Co a lineman may be up one pole or at the end of another and still be on company property. It could be either a utility pole or a fishing pole, depending on whether he's working or playing. Because the utility owns ready-made vacation land which it makes available free to its employees.

Ten cabins are spotted around Calectric's hydroelectric projects on the eastern slope of California's High Sierra. Lakes and creeks abound for the employee-turned-fisherman and his family. The cabins may be occupied during the summer on a first-come, first-served reservation basis.

Journeyman lineman Roger Marron was one of the first comers this season. His family and his brothers set up summer housekeeping 8,000 ft up the Sierra. During a week of his vacation they occupied Intake Two Cabin, above Bishop in the utility's Bishop Creek hydro development.

The vacationers fished and hiked in the beautiful mountain preserve around Bishop Creek which the company keeps open for the public. The lakes themselves were built by Calectric to catch runoff water from the higher elevations and control the flow throughout the summer along the three forks of the creek.

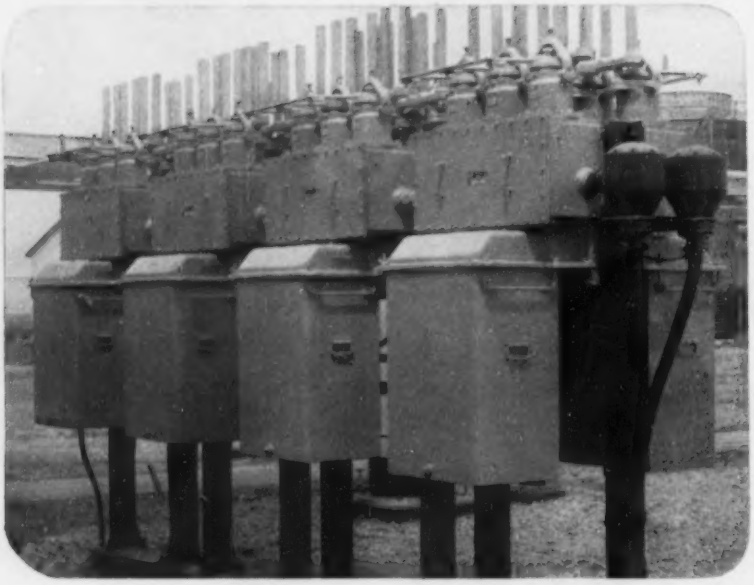
This year the Marrons and 600 other employees and their families enjoyed a mountain vacation—something unusual in power company employee benefits.

MARRON SMALLFRY pick fish for a big fry after a morning of flycasting in the lake outside the cabin's door

FUN TO FISH (right) and fun to get to bed (above) on crisp nights (especially when you have this multiple-bunking arrangement)

protect your motor starters with

"FCBX" cutouts



G&W "FCBX" Cutouts Isolate and Protect Motor Starters

In this refinery installation each bank of four motor starters is fed by a cable terminated in a G & W Type "EP" explosion proof pothead. Each starter is connected through a Type "FCBX" Oil Fuse Cutout Box.

Fuses immersed in oil and enclosed in a heavy cast steel housing provide overload and short circuit protection. The gang operated mechanism provides three phase oil switch isolation.

Various other combination units are regularly made to meet individual requirements for switching, fuse protection, and cable connection.

G&W ELECTRIC SPECIALTY CO.
7780 Dante Avenue, Chicago 19, Illinois

Representatives in principal cities of U.S.A.
In Canada—Powerlite Devices, Ltd., Toronto, Montreal & Vancouver

G&W

C 542

New Luzon Line

Carries 230 Kv

*A. C. JIMENEZ, Assistant to General Manager, National Power Corp., Manila, P. I.

Sound engineering has combined six economical features in the design for a new 230-kv transmission line that will be part of the Agno River Power Development in the Philippine Islands.

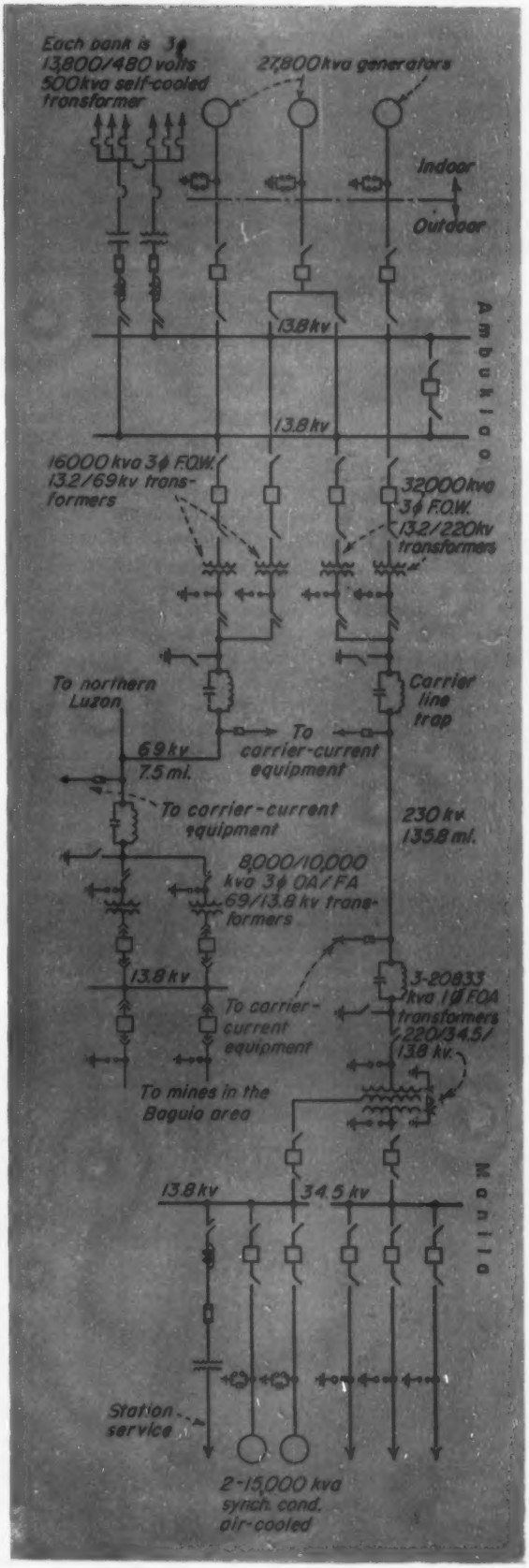
Features of the line connecting the Agno River plants with central Luzon and Manila will be:

1. A design based on the direct stroke theory.
2. Use of non-magnetic aluminum clamps throughout.
3. Measures against fatigue failure of conductors and ground wires.
4. Elimination of arcing horns and grading shields.
5. Long spans.
6. Elimination of transposition.

The Agno River project will have seven hydro plants—Ambuklao, Binga, Itogon, Tabu, Tayum, Kalipkip, and Lubas—with a total capacity of 430,000 kw. The hydroelectric plants will be remote from any established power market. Consequently, the transmission system bringing the generated power to consuming areas will be a major aspect of the development. Bulk of the power will be transmitted over 230-kv lines to central Luzon and the Manila integrated system. The lines will be bussed in Magalang, Pampanga Province, and to this bus a 230/69-kv power transformer will be connected to feed central Luzon by 69-kv radial lines.

Parts of northern Luzon, including Baguio and nearby mines, will be fed by 69-kv lines straight from Ambuklao, first of the plants to be developed along the Agno.

Ambuklao is about 10.5 air miles northeast of Baguio, summer capital of the Philippines, and 135.8 transmis-



AMBUKLAO in north sends Agno River power via new 230-kv steel-tower transmission line to central Luzon and the Manila System

sion miles from Manila's northern suburb, Quezon City. At the latter will be situated the step-down substation for all the Agno power fed into the Manila integrated system.

Terrain . . . The Ambuklao-Manila 230-kv lines will consist of 21.7 miles on double-circuit and 114.1 miles on single-circuit towers. All double-circuit towers and 5.6 miles of the single-circuit construction will be in very mountainous and rugged terrain where landslides are common. The other 108.5 miles of single-circuit construction will traverse relatively flat country. Double-circuit towers will be used where the spotting of towers is difficult. Here plans call for two 230-kv lines, although initially only one circuit will be strung.

The 230-kv line between Ambuklao and Manila, designed for a maximum wind velocity of 80 mph, should withstand a wind pressure of 16 psf on cylindrical surfaces, such as conductors and insulators, and 25.6 psf on the flat surfaces of steel angles of towers. The line is designed to operate in ambient temperatures of 45 to 106 F and at conductor temperatures of 45 to 175 F.

Choice of Conductors . . . Considering the investment, I^2R losses, corona, and average annual loss factor in the life of a transmission line, the designers selected 795 Mcm, ACSR as the most economical conductor.

A cable, having 54 strands of aluminum and 7 of steel, and an ultimate strength of 28,500 lb, will be used between Pangasinan and the Manila substation. This 114.1-mile portion will cross relatively flat terrain where the maximum tension can be kept within 11,400 lb under the worst conditions.

Higher tensions were the consideration in selecting the conductor for the mountainous area between Ambuklao and Pangasinan. For this section 795 Mcm ACSR, having 30 strands of aluminum and 19 of steel and an ultimate strength of 38,200 lb, was chosen. The designers' choice for overhead ground wire was a ⅜-in., EHS, 7-strang galvanized steel wire.

Lightning Performance . . . In an area with an isokeraunic level of about 65, no flashover is expected up to a direct stroke with a discharge current of 105,000 amp. The line is designed on the direct stroke theory of not more than one per 100 circuit miles per year. For a length of 135.8 miles, this means an outage probability of only 1.36 times per year.

Insulators required for a footing electrical resistance of 15 ohms is 12.1 units of the 5¾ by 10-in. variety. As this figure is based on coupling factors corresponding to a ground wire 100 ft above ground and a separation of 30 ft between the ground wire and conductor, it must be corrected for actual conditions. A preliminary tower layout indicated that this correction factor is about 0.87% so that the required number of insulators is 12.1/0.87 or 13.9.

On the proposed line 14 units will be used for the suspension supports and 16 for tension supports. The impulse strength of this insulation will be 1,270 kv on a 1½ × 40 impulse wave.

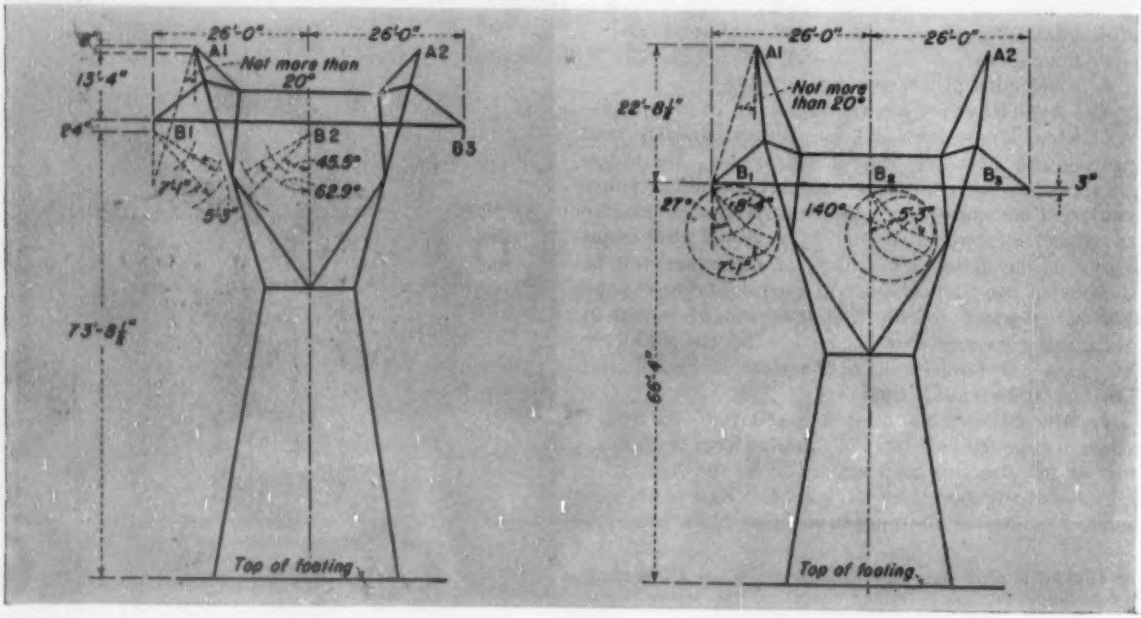
Clearances . . . This insulation will be matched by an 82-in. conductor-to-tower clearance. To obtain such clearance up to maximum wind velocity, however, was not considered economical as lightning does not accompany typhoons. It was considered adequate to obtain this 82-in. clearance in a wind velocity of 57.9 mph.

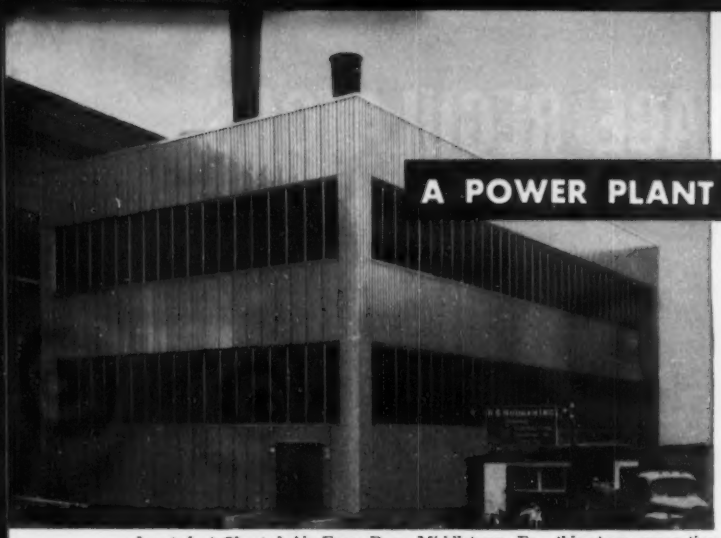
The tower configuration for an 82-in. clearance in a 57.9-mph wind will provide a 60-in. conductor clearance in an 80-mph wind. This latter clearance will take care of the maximum expected switching surge of 750 kv, or 530-kv rms value. The 60-cps flashover voltage of a 60-in. air gap is 580 kv rms. To preserve the above clearances

(*Continued on page* 25)

TYPE SA, a tangent or suspension tower, is one of the three basic types in the transmission line where the terrain is relatively flat

TYPE SAH, tangent, heavy-construction tower supports 2,300-ft spans and has been designed for a maximum wind loading of 16 psf at 45 F





Located at Olmsted Air Force Base, Middletown, Pa., this steam generating plant is sided with more than 7,000 square feet of Stainless Steel panels. Architect-Engineer: Gannett, Fleming, Corddry & Carpenter, Harrisburg, Pa. General contractor: R. S. Noonan, Inc., York, Pa.

Two types of Stainless Steel panels combine to give the Metallurgical Laboratory at United States Steel's Fairless Works an attractive exterior. Architect: Hoffman and Crumpton, Pittsburgh, Pa. General contractor: Joseph R. Farrell, Inc., Philadelphia, Pa.

9,000 square feet of wall surface in National Malleable and Steel Castings Company's Technical Center, Cleveland, Ohio, is Stainless Steel. Architects and Engineers: Dalton-Dalton Associates, Cleveland. General contractor: The Leonard H. Krill Company, Inc., Cleveland.

USS STAINLESS STEEL

USS

SHEETS • STRIP • PLATES • BARS • BILLETS
PIPE • TUBES • WIRE • SPECIAL SECTIONS

4-200B

These three buildings went up faster, will stay attractive longer with Stainless Steel panel construction

• Although Stainless Steel was first used as a material of construction more than 25 years ago, its use in the form of insulated panels is a comparatively recent development. But it has been accepted so rapidly that a wide variety of buildings using Stainless Steel panel construction are completed and occupied today.

Here are three structures . . . differing widely in size, in design and in purpose . . . that demonstrate the advantages of Stainless Steel panel construction.

From the standpoint of design, Stainless Steel panel construction offers simple, clean lines with a material that never loses its attractive appearance. Stainless Steel panels can be combined with other materials with pleasing results. And their method of erection—they are hung on the structural framework—allows fullest possible utilization of interior floor space.

Erection is quick and cost-saving. It requires a minimum crew and goes forward in any type of weather.

Once the building is occupied, Stainless Steel panel construction continues to pay off. Maintenance is at a minimum . . . no painting is required. The low thermal conductivity of these insulated panels holds down heating and cooling costs. And the life of the building is long.

If you would like more information on panel construction with USS Stainless Steel, mail the coupon below.

UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Stainless Steel panels on these buildings fabricated and erected by H. H. Robertson Co., Pittsburgh, Pa.

United States Steel Corporation
Room 4426, 525 William Penn Place
Pittsburgh 30, Pa.

☐ Please send me literature on Stainless Steel panel construction.

☐ Please arrange to have fabricators of Stainless Steel wall panels send me literature on their particular type of construction.

Name..... Title.....

Address.....

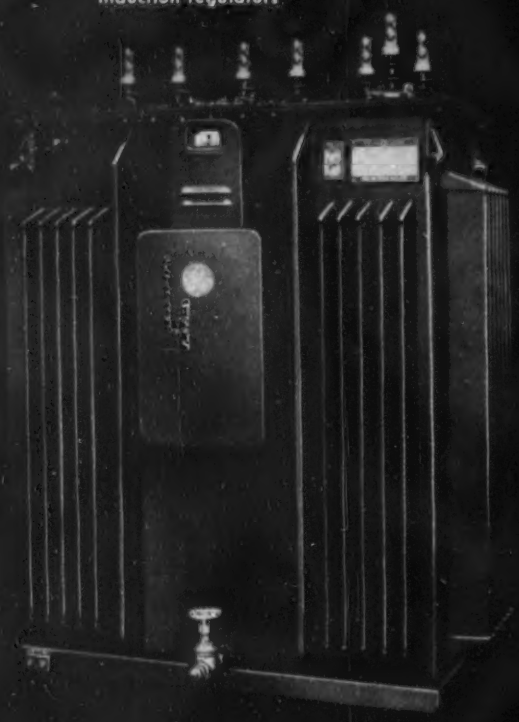
City..... State.....

United States Steel produces only the Stainless Steel from which panels of this type are made; the panels themselves are fabricated by our customers.

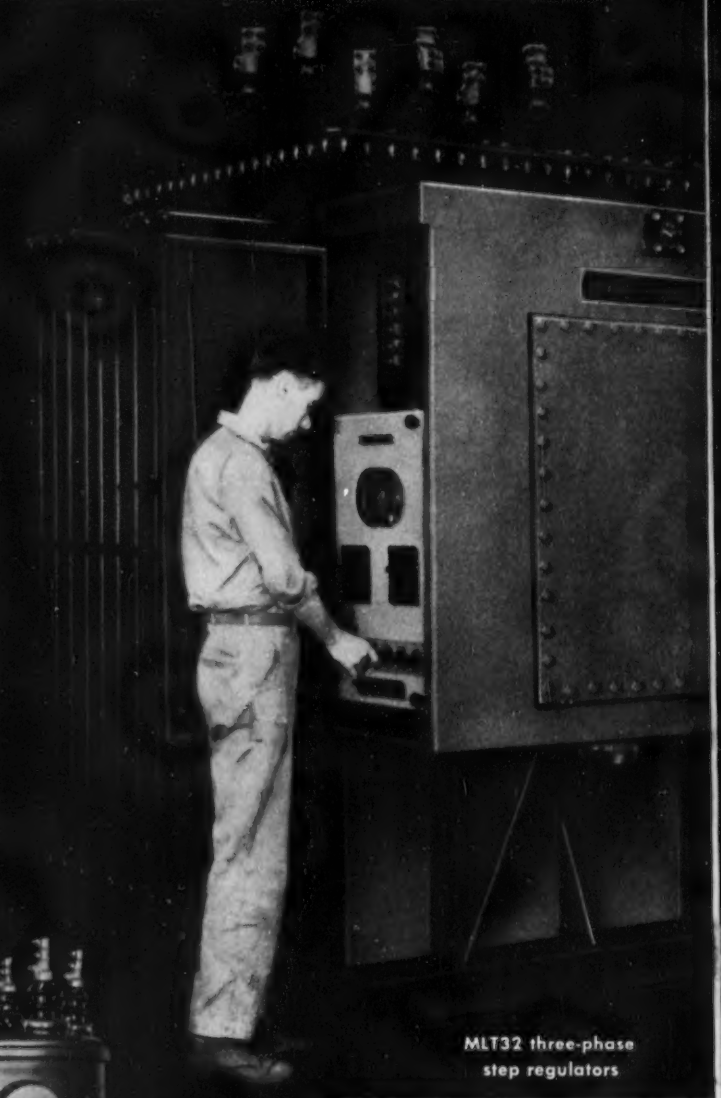
UNITED STATES STEEL

FEEDER VOLTAGE REGULATORS

a complete line of both step and induction



IRT three-phase
induction regulators



MLT32 three-phase
step regulators

IRS single-phase
induction regulators

ML32 single-phase
step regulators

ADVANTAGE OF CLASS 1 ACCURACY is illustrated in diagrams at right which show how a reduction in *effective* bandwidth permits a greater voltage drop in primary, transformer, and secondary while maintaining the same voltage standards from first to last consumer.

regulators with the economy of

Class 1 Accuracy at no extra cost

Whatever your voltage problem, you'll find a dependable, low-cost solution in this complete line of General Electric feeder voltage regulators.

G-E Induction Regulators, available for circuits up to 15 kv and 3000 kva, provide smooth, stepless control and need virtually no maintenance. For close regulation of single-phase feeders where operations are frequent and immediate voltage correction is required, G-E Type IRS single-phase induction voltage regulators offer the finest regulation obtainable. Their rugged operating mechanism and the elimination of switching contacts give you a maintenance record unbeaten anywhere. Type IRT three-phase induction regulators offer the same advantages of rugged construction, long life, and negligible maintenance.

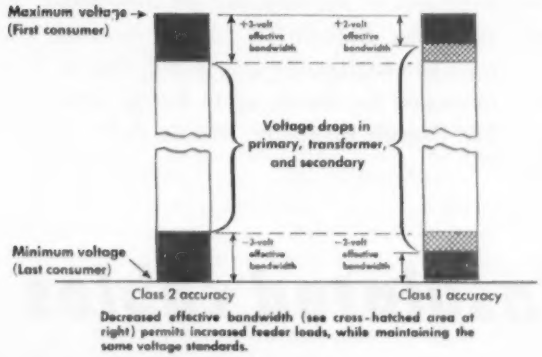
G-E Step Regulators assure dependable and economical regulation where you handle large blocks of power, and where you need supplementary regulation on your branch and rural feeders. For three-phase circuits, station-type MLT32 regulators adjust voltage in thirty-two 5/8% steps (Best suited for lines with balanced loads). They feature accessibility and ease of maintenance of switching mechanism. G-E Type ML32 single-phase step regulators also adjust voltage in thirty-two 5/8% steps, and give low-cost, dependable regulation on branch and rural circuits.

Class 1 Accuracy, the highest accuracy classification defined by ASA Standards, is a standard feature on *all* G-E voltage regulators. When compared with regulators with Class 2 or Class 5 accuracy, the G-E regulator with Class 1 accuracy permits (1) greater feeder length at the same load density, (2) greater load on existing feeders, or (3) higher voltage standards on existing feeders. Insist on Class 1 Accuracy controls. They mean *dollars* in your pocket with not one additional *cent* in investment.

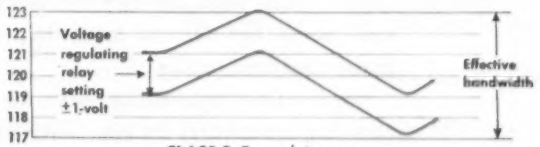
For More Information about G-E voltage regulators, contact your nearest G-E Apparatus Sales Office or authorized agent. Or write Section 423–4, General Electric Company, Schenectady 5, New York.

Progress is our most important product

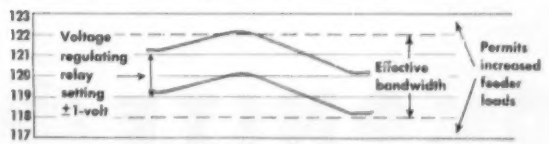
GENERAL ELECTRIC



Decreased effective bandwidth (see cross-hatched area at right) permits increased feeder loads, while maintaining the same voltage standards.



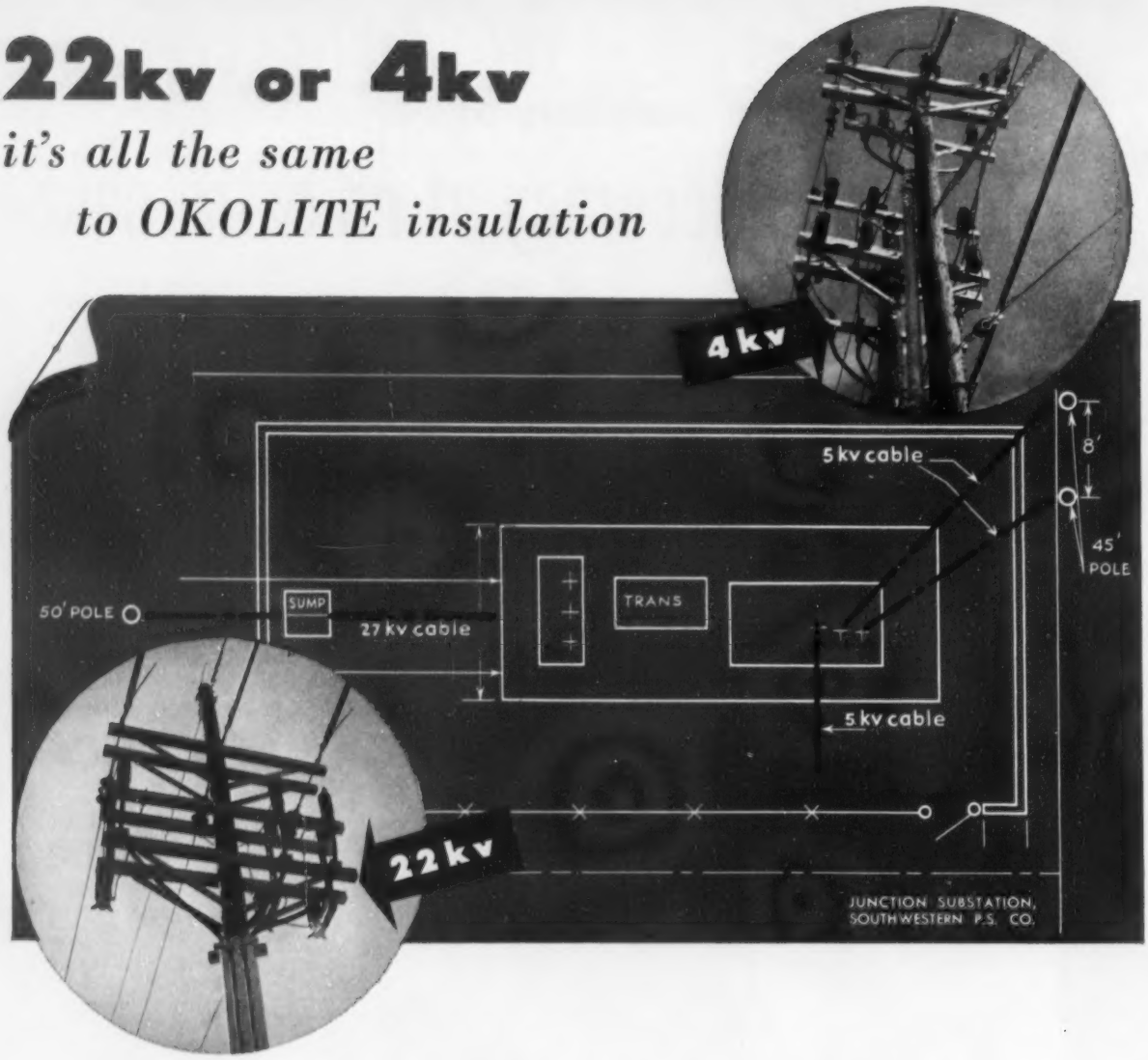
CLASS 2 Control Accuracy



CLASS 1 Control Accuracy

22kv or 4kv

it's all the same to OKOLITE insulation



High voltage or low voltage—Okolite rubber insulation provides maximum dependability and utmost safety. Here at the Junction Substation of the Southwestern Public Service Company in Lubbock, Texas, both the 4kv and 22kv circuit risers are Okolite-insulated, Okoprene-sheathed cables.

Okolite-Okoprene cables have an outstanding reputation for reliability in circuits up to 35,000 volts. Okolite-Okoprene is easy to handle and cuts installation costs; the problem of oil migration is nonexistent and splices and terminations require less time and labor.

Write today for Okonite's complete handbook on rubber-insulated, high-voltage cables, Bulletin EW-1075. It contains complete engineering and installation information for circuits up to 35,000 volts. The Okonite Company, Passaic, N. J.

OKONITE OKONITE SINCE 1878 ***insulated cables***

2304

230-Kv Luzon Line

(*Continued from page* 20)

in angle or dead-end type structures, the jumper will be supported on jumper insulators consisting of 16 units of 5¾ by 10 insulators.

A single string of 5¾ by 10-in. suspension type insulators with a mechanical rating of 15,000 lb will be used on suspension points. On the line between Pangasinan and Manila double-strain yokes with two strings of 16-unit insulators will bs used. On the line between Ambuklao and Pangasinan, where stresses are higher, triple-strain yokes with three strings will be used. This arrangement will simplify construction and stocking of spares.

Non-magnetic clamps made of aluminum will be used throughout the line with a view to much lower clamp losses, less heating of the clamps, greater resistance to corrosion, and fewer fatigue failures in the conductors (lighter weight of the clamps, it has been assumed, will help to prevent failures).

Measures Against Fatigue . . . The following measures against fatigue failures of conductors and ground wires are incorporated in the design:

1. Stockbridge vibration dampers will be installed on all spans dead-ended at one or both ends.

2. Tapered armor rods will be applied at all suspension points of the ground wire.

3. Pre-formed armor rods will be applied at all suspension points of the ground wire.

4. An allowance of 25% of ultimate strength has been made for every-day tensions and of 40% for maximum tensions.

Arcing horns and grading shields have been dispensed with in the design. They protect the insulator string by providing a spill gap across the string. This spill gap lowers the inherent line insulation, thereby increasing the outage probability. The function of these devices in protecting the conductor and insulators in the event of flashovers can be adequately served by armor rods around the conductors.

Longer Spans . . . In designing the line, no attempt was made to determine the most economical span. Instead, a normal span of 1,300 ft was chosen arbitrarily on the ground that the incremental cost, if any, for the longer spans can be more than justified by the increased reliability of the line. Thus some of the spans in this line will probably be the longest ever strung in the Philippines, the maximum being 1.21 miles. For such long spans the conductor horizontal separation must be 38 ft, making the tower cross-arm 76 ft long.

Line Charging . . . At the sending end, 32,000 kva charge this line with 220 kv. The Ambuklao generators have a rating of 27,800 kva each and a short-circuit ratio of 1.1. Thus the line charging capacity of each generator is 88% of 27,800, or 24,464 kva. Normally, two generators will charge the line. The power transformers at Ambuklao and Manila, however, will have a gross rating of 126,500 kva and will take an excitation of about 3%, or 3,800 kva. By lowering the sending end voltage to 206,000, the charging kva will be reduced to 28,100 kva.

Thus one generator with the terminal voltage reduced to 12.4 kv can charge the line, provided the receiving end transformers are connected to the line as normally they will be.

POWER BRIEFS FROM THE NEWS

● First unit of Carolina Power & Light Co's new Wilmington, N. C., steam plant has been placed in operation. The 150,000-hp unit will reach full production Oct. 21, the date set for its dedication and also the 75th anniversary of the discovery of the first practical incandescent lamp. Second unit will be completed in mid-1955.

● Chugach Electric Association, Inc, of Anchorage, Alaska, has approved a $6.3-million expansion program which calls for addition of 5,000 kw and a new transmission line network. It plans to finance the program, which involves development of hydroelectric site on Kenai Peninsula, with a $5-million loan from Rural Electrification Administration.

● Construction of the $21-million Eagle Gorge Dam on the Green River, Wash., may get under way next year, according to Col Louis H. Foote, Army Corps of Engineers' new North Pacific Division engineer. He reports that engineering work can be completed with the $170,000 just provided by Congress. He added that it's reasonable to expect next year to see construction money provided.

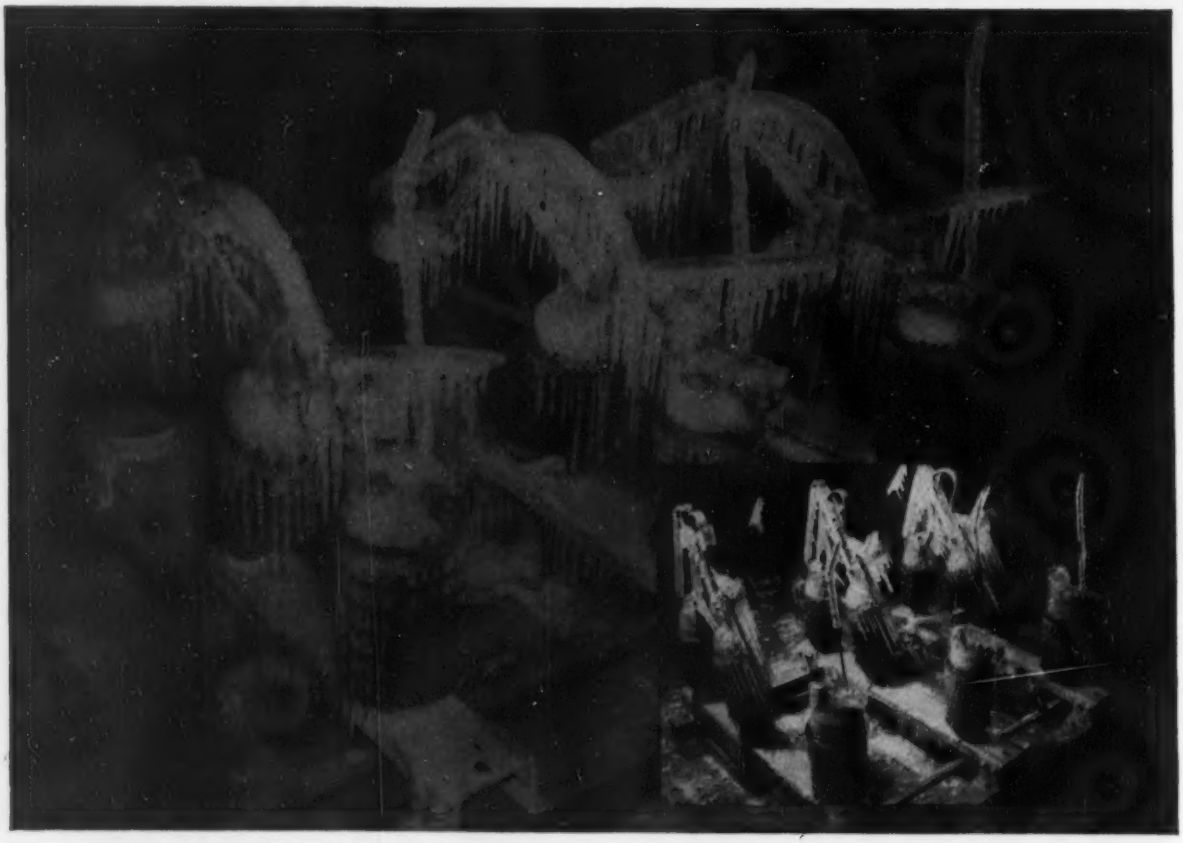
● Union Electric Co has reported that air conditioners now consume 12 to 15% of the electric power used in and about the St. Louis area. Cooling load was estimated at 168,000 kw. Approximate number of room-type air conditioners was placed at 60,000 by the company.

● Tennessee Valley Authority reports that the fourth 135,000-kw unit at its Kingston steam plant has been placed in commercial operation, boosting system capacity to 6,323,185 kw.

● Philadelphia Electric Co reports that bids will be received in the near future for construction of a new $1.5 million service building at Plymouth near Norristown. The new structure, which will house consolidated operations now performed at several locations in Norristown, will serve as electric and gas service headquarters for the Schuylkill Valley and Perkiomen Valley sections of Montgomery County. Work on the two-story building will be started this fall with completion set for 1955.

● Southern Maryland Electric Cooperative, Inc, has received permission from the Maryland Public Service Commission to borrow $2,805,000 from the Rural Electrification Administration. Loan will finance installation of 240 miles of distribution lines, 260 miles of tie lines and improvement to co-op's Hughesville headquarters.

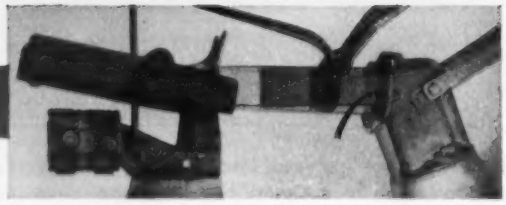
● Portland (Ore.) General Electric Co expects to start construction about Sept. 1 on a new $1.1 million service center to expand present service facilities. The building will include an existing warehouse which will be modified to provide additional storage. The new center, slated to have a transformer shop and office space, is designed to support four additional floors, which may be added when more space is needed.



you can always open or close

CHANCE WN-VN SWITCHES

...even after the heaviest ice storms



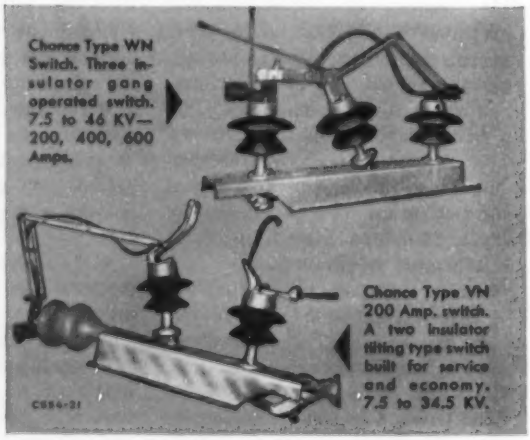
Double exposure shows exclusive ice breaking "crow bar action." Pivot pin is forced up against slot in blade—prying rear of blade up 3/8" before contact end is lifted. Clamp shown in photo was used to simulate the effect of heavy ice on the clip.

It only takes one man at the controls, even after the most severe ice storms, to open or close Chance WN-VN pole top switches. The heaviest ice... ice that will not yield to solid hammer blows is broken by the "crow bar" leverage of the blade and the *extra* leverage of the Compensator Control Mechanism.

Under test conditions, Chance WN-VN switches have been coated with three-quarters of an inch of hard, clear, bubble-free ice made from distilled water. In temperatures ranging from 20° above zero to 16° below zero, these switches were opened and closed without difficulty... and with no resultant damage to blades or mechanism.

Because of the Compensator Control, all blades in a three-pole switch always make complete contact—regardless of warping, twisting, settling or bowing of wood supporting structures.

Chance WN-VN pole-top switches are easily and economically installed... no threading of the shaft is required. For reliable switching under any conditions plus minimum maintenance, specify Chance Type WN or VN switches. Write for complete information and prices.


Chance Type WN Switch. Three insulator gang operated switch. 7.5 to 46 KV—200, 400, 600 Amps.
Chance Type VN 200 Amp. switch. A two insulator tilting type switch built for service and economy. 7.5 to 34.5 KV.
CS56-21

You know it's RIGHT when you specify CHANCE

ABC INDUSTRIALS

A·B·CHANCE CO·

CENTRALIA, MISSOURI
SAN FRANCISCO, CALIFORNIA

New Atomic Firm

Nuclear Science & Engineering Corp formed. Gordon Dean, ex-AEC head, is chairman

Formation of a new company—Nuclear Science & Engineering Corp—to provide services in the fields of nuclear power development and radioactivity application to industrial processes and products has been announced. Gordon Dean, chairman of the board of the new company and former chairman of the U. S. Atomic Energy Commission, said that American Metal Co, Ltd, and Ketay Manufacturing Corp, together with Lehman Brothers, investment bankers, participated in the creation of the new enterprise.

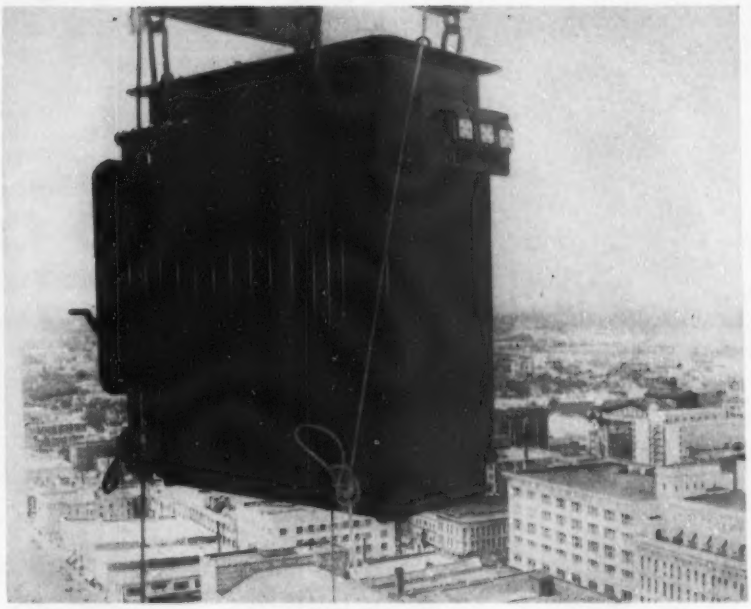
Supplement to Existing Groups . . . The new company will supplement two growing groups in the nuclear field—those engaged in reactor design and engineering, and those which manufacture radiation detection instruments. Services will include radiation measurements, analyses, testing, consulting, design, research, and development.

Ronald A. Brightsen is president of Nuclear Science. He formerly was with the Atomic Power Division of Westinghouse Electric Corp, as were the company's vice president and technical director, Dr Ralph L. Ely, and the secretary-treasurer, Richard S. Frankel. The three men are also directors of the company.

Other directors of the firm are: Dr Glenn T. Seaborg, professor at University of California; Dr Mason Benedict, professor at Massachusetts Institute of Technology; Dr Truman P. Kohman, professor at Carnegie Institute of Technology; Freeman H. Dyke, American Metal; Morris F. Ketay, president of Ketay Manufacturing; and William H. Osborn, Lehman Brothers.

Headquarters for Nuclear Science will be in Pittsburgh, Pa. A spokesman for the firm said that this location was chosen because some of the officers already reside there and because that area is a "center of nuclear engineering" at present.

When asked if the new company had any part in the Duquesne Lighting Co-Westinghouse nuclear project at Shippingport, Pa., a spokesman replied "not yet."



Topmost Transformer in Denver

This 500-kva transformer, weighing 7½ tons, is shown in the sky 250 ft above downtown Denver. The Westinghouse Electric Corp transformer was one of three hoisted to a penthouse atop the 23-story Denver Club building, nearing completion. The three transformers are being installed in the penthouse along with motors for the elevator and air conditioning systems. They are the highest transformers in Denver.

Capitalization Is $25,000 . . . Capitalization for the company, set up under Pennsylvania laws, is $25,000 in common shares. American Metal owns 20% of the total, and Ketay 80%. There will be no public issues, according to the spokesman. Projects will be supported by the parent companies.

The company has signed no contracts yet. However, negotiations are under way for low-level radio active measurement contract. If the contract is obtained, work will begin about the first of September after the company's laboratory is in operation.

Breaks Ground for Plant

Long Island Lighting Co has broken ground at Anderson's Island, Island Park, N. Y., for the Edward F. Barrett power station, the utility's largest power plant. Construction will start immediately on first 170,000-kw unit with operation set for October, 1956. It will cost about $25 million. Five other units will be added when needed.

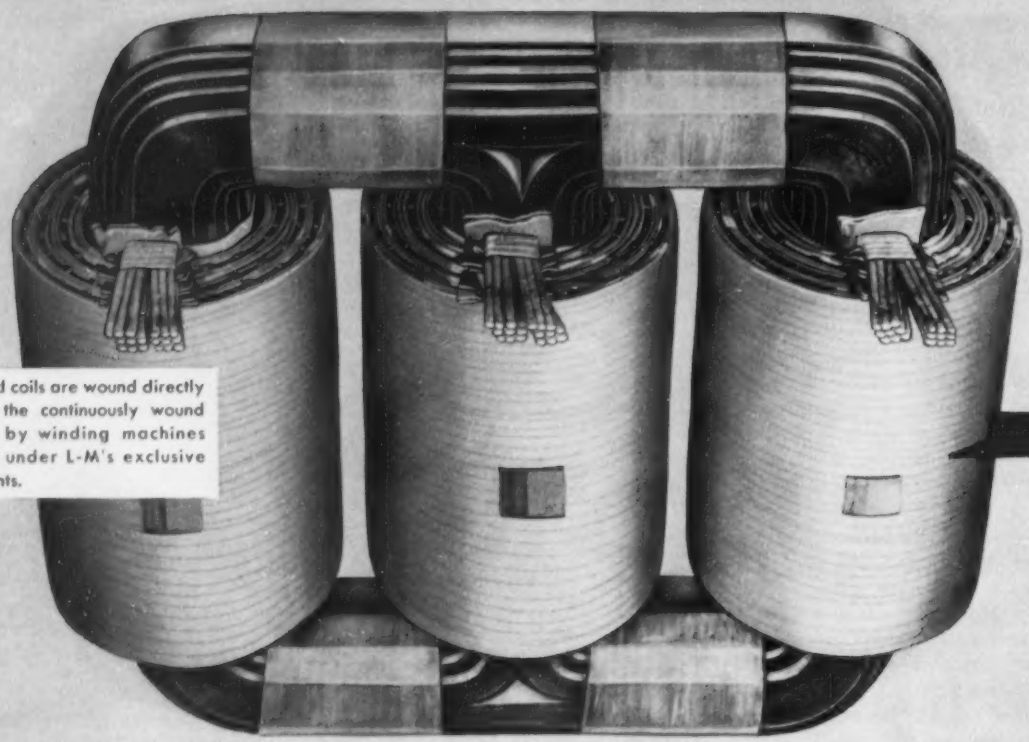
AIEE Will Reproduce Conference Papers in '55

American Institute of Electrical Engineers recently announced a new policy designed to make conference papers available to AIEE members and other interested parties.

Under the new procedure, which goes into effect at the institute's winter meeting in New York, Jan. 31-Feb. 4, 1955, conference papers will be submitted to AIEE 60 days before the meeting. The institute will have them reproduced and offer them for sale along with technical papers which have been sold by AIEE for years.

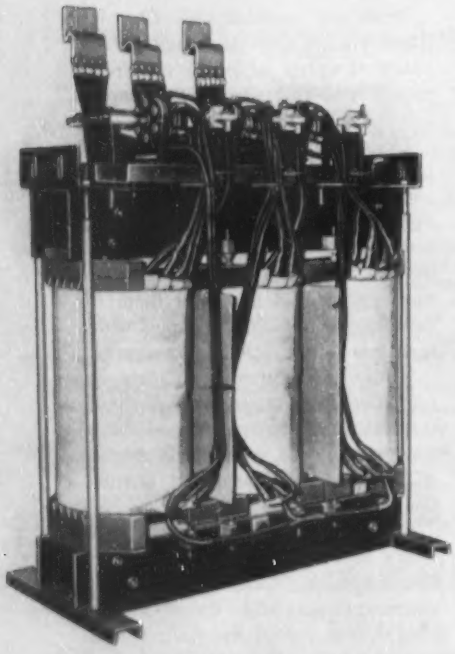
Authors of conference papers not submitted in advance, may distribute them at the conference, but additional copies must be made available to AIEE for further sale and distribution.

Heretofore, only technical preprints, which are approved by the Committee on Technical Operations and become part of the literature, have been sold at general and district meetings and have been available through mail order for a reasonable time.

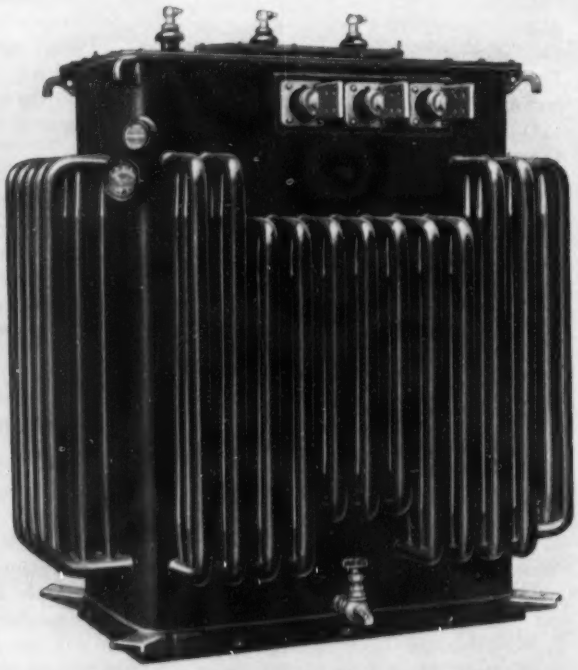


Round coils are wound directly onto the continuously wound core by winding machines built under L-M's exclusive patents.

L-M Announces New Uni-Wound℠ 3-Phase

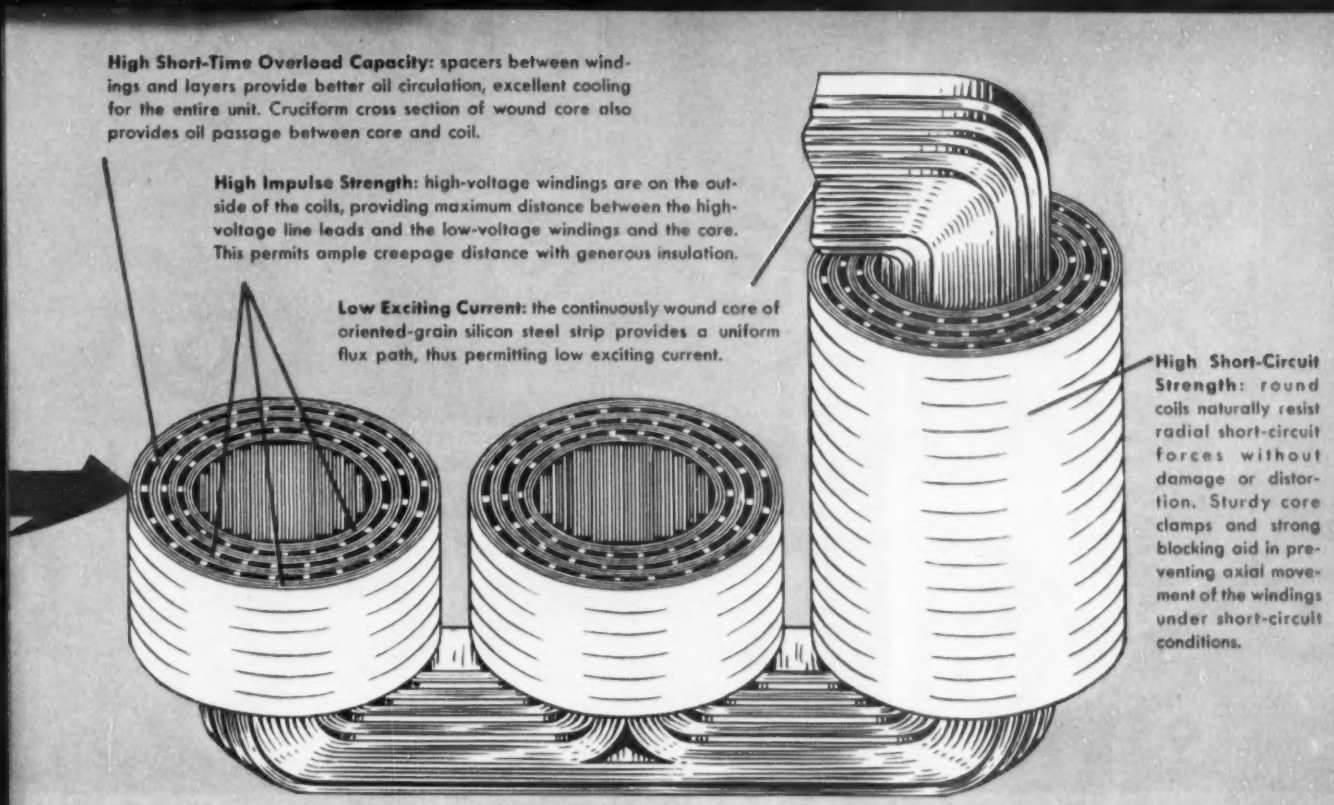


Core-coil assembly for a 500 kva Uni-Wound transformer. The sturdy core clamping frame and strong blocking contribute to high short-circuit strength.



Completed 500 kva Uni-Wound 3-phase transformer. The unit is smaller, shorter, and lighter than L-M's previous type. The transformer provides all the well-known advantages of L-M's single-phase Round-Wound transformers.

"Uni-Wound" and "Tri-Wound" are Line Material Company trade-marks.


High Short-Time Overload Capacity: spacers between windings and layers provide better oil circulation, excellent cooling for the entire unit. Cruciform cross section of wound core also provides oil passage between core and coil.
High Impulse Strength: high-voltage windings are on the outside of the coils, providing maximum distance between the high-voltage line leads and the low-voltage windings and the core. This permits ample creepage distance with generous insulation.
Low Exciting Current: the continuously wound core of oriented-grain silicon steel strip provides a uniform flux path, thus permitting low exciting current.
High Short-Circuit Strength: round coils naturally resist radial short-circuit forces without damage or distortion. Sturdy core clamps and strong blocking aid in preventing axial movement of the windings under short-circuit conditions.

Transformers in 112½ to 500 kva Sizes

Provides advantages of L-M Round-Wound® core construction in 3-phase transformers in sizes from 112½ through 500 kva. They're lighter, smaller, have improved overload capacity, high impulse level, high short-circuit strength.

By **ALVIN B. COYLE**
Manager,
Transformer Sales
Line Material Company

L-M Round-Wound construction consists of a continuously wound core, with round coils wound directly onto the core. This design has a number of advantages in improved performance and better mechanical strength.

Uni-Wound Fills Need

Now L-M engineers have developed a 3-phase transformer with all the advantages of Round-Wound construction. This is the new *Uni-Wound* transformer, which is now in production in sizes from 112½ through 500 kva, and in voltages through 13,800. In smaller 3-phase sizes L-M offers the new *Tri-Wound* transformer.

Continuously Wound Core

The Uni-Wound transformer consists of a unitary core, continuously wound of oriented-grain silicon steel strip. The bare core is annealed after winding. Then round coils are wound directly onto the three core legs by L-M's exclusive winding process.

All Other Round-Wound Advantages

Thus all of the inherent characteristics of the single-phase Round-Wound transformer are provided in the 3-phase Uni-Wound. These advantages include:

high short-time overload capacity
uniformly high impulse strength
high short-circuit strength
low exciting current
lighter weight • smaller size

Uni-Wound Lighter, Lower

The 500 kva Uni-Wound is about 1200 pounds lighter than the stacked lamination type. The 112½ kva, 2400 volt delta Uni-Wound is about 400 pounds lighter than the 112½ kva Triplex style. These lighter weights permit single-pole mounting of sizes through 150 kva instead of the 2-pole platform construction previously required. In some sizes, the over-all height has been reduced as much as two feet, with but little increase in projected floor space.

Balanced Performance

Both the physical and performance characteristics have been well balanced in the Uni-Wound 3-phase transformer design. Just as with the single-phase Round-Wound, no one characteristic has been emphasized at the expense of another. No one characteristic has been considered exclusively by itself, but only in its relationship to the over-all performance of the transformer.

Get Details on Uni-Wound Transformers

Ask the L-M Field Engineer to give you full details; or write Line Material Company, Transformer Division, Zanesville, Ohio. (Line Material Company is a McGraw Electric Company Division.)

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LM® LINE MATERIAL Transformers

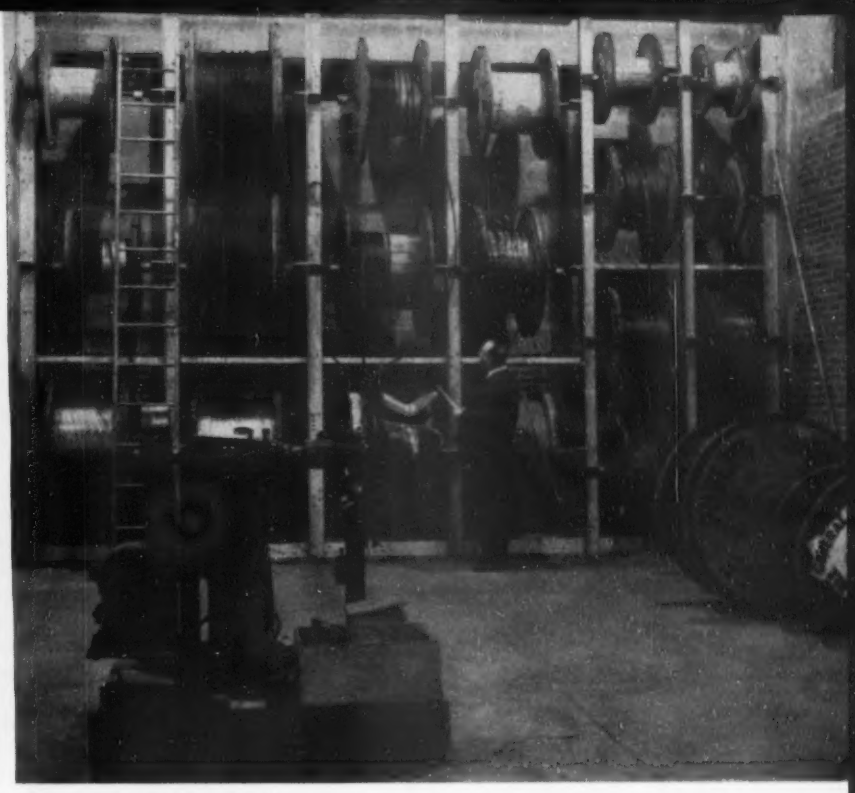
Disbursing Counter

Outdoor Storage Area and Loading Platform at Hicksville Operating

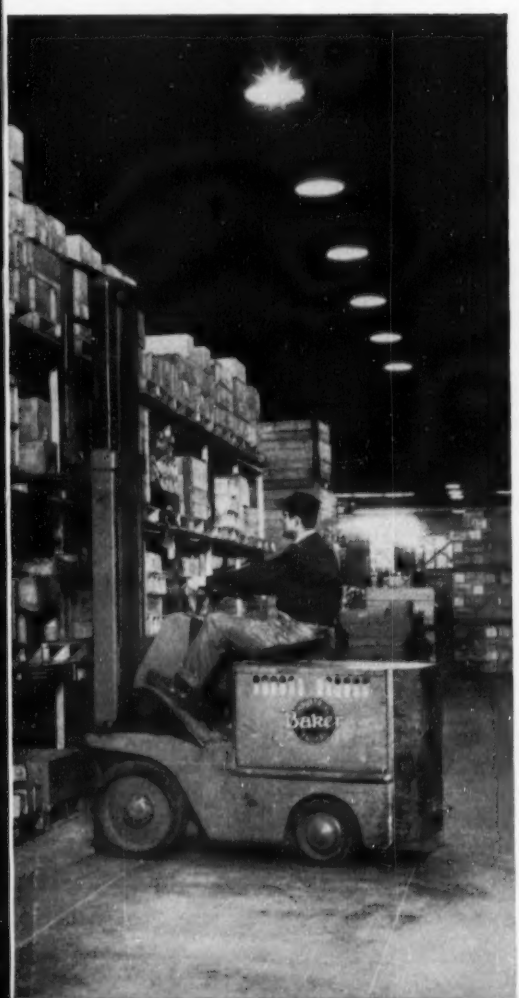
Rotary Bins Dispense Hardware

Fork Lift Truck and Pallet Compartments

Headquarters



Wire and Cable Racks



HICKSVILLE FEATURES MODERNIZED MATERIAL STORING AND HANDLING

W. H. SEAMAN, Assistant Vice President, Long Island Lighting Co, Hicksville, L. I.

Material warehousing and handling were major problems of the Long Island Lighting Co before establishment of the company's new electric operating headquarters at Hicksville, L. I. During planning of the new facilities, a study indicated that an economical solution of these problems entailed centralization of some operations while others could be conducted at other locations.

Accordingly, the main warehouse and certain other storage facilities were set up at Hicksville and several sub-warehouses were continued in operation throughout the territory. The sub-warehouses are supplied from Hicksville, main delivery point for new materials, although large bulky items, such as poles and crossarms, are delivered direct to sub-warehouses.

The pattern of load concentration and growth, proximity of rail facilities, adequacy of roads, and the availability of real estate gave Hicksville priority over other locations for the establishment of the new headquarters. Ideally situated with respect to highways and railroad facilities, the property could be designed to take advantage of both means of shipment.

Operating Warehouse . . . The operating warehouse is framed of reinforced concrete and built up of concrete block walls, the exterior being finished in red brick. The floor is a concrete slab, and the roof fabricated

Story continues on next page

of precast Flexicore slabs and insulated with Fiberglas insulation and built-up roofing materials.

Bulk of the warehouse lighting is furnished by incandescent lamps, but certain areas, notably tool cribs and small-parts bins, are lighted by fluorescent fixtures. Adequate lighting permits round-the-clock handling of material.

The operating warehouse is situated to minimize the handling of materials and equipment from arrival at Hicksville to their loading on trucks for installation on the system. A platform, running the length of the outer south wall, receives shipments directly from railroad cars entering the area on tracks paralleling the platform. The railroad tracks continue past the warehouse platform and alongside a tailboard-high outdoor storage area to a pole storage yard of approximately 120,000 sq ft near the perimeter of the site.

Truck deliveries . . . Much material is brought to Hicksville in trucks which are unloaded along the several hundred feet of tailboard-high platforms surrounding the warehouse and outdoor storage areas. All loading platform and outdoor storage areas are contiguous to and level with the warehouse floor, and access to the interior is through nine large overhead doors.

The entire floor space is marked off by letter and code number to expedite location and handling of material in the operating warehouse. Equipment is palletized in one section where racks have been set up in several tiers. Floor-level pallet compartments are reserved for fast-moving equipment. These compartments are refilled as soon as possible after being emptied. Slower-moving equipment is stored on pallets in higher tiers.

Record Cards . . . Duplicate record cards for each pallet contain the material code number, identifying the type of material, and a number corresponding to the item's physical location in the warehouse. One card is placed conspicuously on the pallet, and its duplicate is kept in a file in the stores office. By this means, any particular item in storage can be immediately located. Bulky but light items, such as street light fixtures, are stacked in alloted spaces for ready location.

Fork lift trucks transfer materials on the platform to assigned locations in both the indoor and outdoor storage spaces. These trucks can stack material on pallets to a height of about 11 ft. Platform scales of 10,000-lb. capacity check incoming and outgoing shipments.

Stacking Wire and Cable . . . Steel racks are used for stacking wire delivered in coil form. These can hold about ten coils stacked side by side. The length of these racks is about the same as the width of a truck van. Thus, when the rack is placed parallel to the truck tailboard, it is in position to receive the coils rolled on to the rack directly from the truck. A fork lift truck then transports the loaded rack into the warehouse. Such racks can be stacked four high.

Wire and cable to be cut into shorter lengths are mounted in a cable rack extending to a height of 14 ft and containing approximately 20 reels. This arrangement permits desired lengths to be reeled off, measured, and transferred to smaller coils for loading on trucks. One corner of the warehouse is a walled-in "rubber" room, equipped with humidifier, where rubber gloves, sleeves, and boots are stored.

Loading Platform . . . The warehouse opens on a large outdoor covered platform which joins the operating warehouse to an outdoor storage area. This platform is used for loading line trucks at night. Night-shift stores crews, using stores requisitions provided by the operating and construction departments, draw required materials and load them on trucks. Commonly used hardware, tape, etc, are in bins near the assembly area for assignment to trucks. These bins are replenished daily by the day shift.

Before trucks are loaded for the day's work, material returned from the field is removed and later sorted according to its condition for return to storage, the salvage shop, or the scrap pile. During night loading, trucks are serviced in place with gasoline, oil, and water as required. Electric outlets are provided along the platform for plugging in electric under-the-hood engine heaters for reducing delays in starting and warming up in winter.

Outdoor Storage Area . . . The outdoor, tailboard-high storage area at the far end of the covered platform affords 63,000 sq ft of storage space for equipment that can be left exposed. A small building in one corner is used for storing cement and other masonry materials. The system for allocating and identifying inside storage areas and for maintaining storage records applies to the outdoor area.

There is also a supplementary storage space of 63,000 sq ft at grade level. This is available for heavy equipment and miscellaneous slow-moving material which may be exposed to the weather. Altogether, including the operating warehouse, there are approximately 300,000 sq ft of storage space.

Salvage Shop . . . A salvage shop, encompassing a distribution transformer testing room, adjoins the warehouse and opens on the covered loading platform. In the salvage shop, material returned from the field is disassembled and sorted. Re-usable and repairable parts are routed for storage or repair, and unusable material is disposed of as scrap. Line hardware, such as cutouts, crossarm braces, bolts, and street lighting fixtures, are examined to determine repairs.

When practicable, worn parts are replaced, and equipment re-threaded or cleaned and returned to storage. Chemical baths degrease and remove surface oxides on connectors and air-break switch parts. A special rig unreels used conductor for inspection and measurement. Such conductor is then classified according to its usability and returned to storage or consigned to the scrap pile.

Handling Transformers . . . Distribution transformers up to 100-kva size, when returned from the field, are reconditioned by replacing defective bushings and oil and by painting the tank. Transformers are then subjected to continuity, ratio, and polarity tests in the testing room. In a tool room in the salvage shop, hand tools issued to individuals or assigned to trucks are marked for identification.

Don Jenkins, Manager, and C. J. Burke, Gas Turbine Sales, go over a recent proposal recommending . . .

Low-cost relief for growing loads and older stations with the Westinghouse 5000-kw Gas Turbine Power Plant

This 5000-kw gas turbine, along with two others, is slated for tough, base load service in a remote area. These same units are also ideal for:

End-of-line, peaking and stand-by service.
Improving plant thermal efficiency in existing stations.

Westinghouse Gas Turbines have some very special advantages for these jobs . . .

- Complete, self-contained power plant. Quick and easy to install, requires less foundation and building than any other type of plant.
- Absolute minimum of personnel to operate and maintain . . . only one operator needed per shift.
- Can operate without cooling water, a tremendous remote site advantage.
- Boost capability . . . exhaust heat can be used to take extraction load off steam turbines, increase plant thermal efficiency and capacity at the same time.
- Proved reliability—meets every criteria for utility dependability.

It all adds up to one big factor. Properly applied, a Westinghouse Gas Turbine offers a low-cost method to increase capability. We're ready NOW to help you with complete facts and figures. Call your salesman or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-50570

GAS TURBINE POWER PLANTS FOR ELECTRIC POWER GENERATION . . .

1250KW TO 15,000KW

YOU CAN BE SURE . . . IF IT'S

Westinghouse

Helping the industry meet its growing loads

Designing transformers to measure ever higher voltages

"Will it be possible to measure tomorrow's higher voltages on a practical basis?" As recently as one year ago, utility management did not have an answer to that question.

Today, it can be answered—in the affirmative—with assurance. The highest voltage potential transformer ever built—for 330 kv—is tangible evidence.

This tremendous unit would have been even larger—perhaps impractical without the sound basic design made possible by over twenty years of utility co-operation and continuing high-voltage research. This work has resulted in various important developments many of which have been Westinghouse "firsts" for the industry. To name just a few—

Oil-filling under vacuum was first introduced by Westinghouse to assure full impulse strength the moment the units are placed in service. This practice has been accepted as a standard of the industry.

Quality-control impulse testing was another Westinghouse innovation which has been highly successful in improving the reliability of instrument transformers in general.

Hipersil® for transformer cores, still a Westinghouse exclusive, is a highly permeable, grain-oriented silicon steel, which makes possible substantial reductions in transformer size and weight.

All of these research results, plus the vast storehouse of application knowledge accumulated by Westinghouse engineering over the years, have their place in the practical measuring of tomorrow's higher voltages. They are proof of the continuing objective at Westinghouse to provide utilities with equipment which will continue to aid them in successfully meeting their growing loads. J-97181

YOU CAN BE SURE... IF IT'S Westinghouse

Largest potential transformer built!

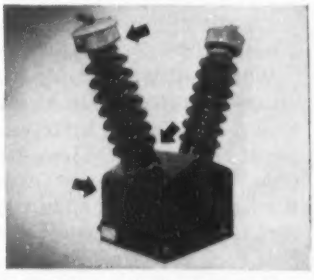
The Westinghouse Type VP potential transformer—the largest ever built—illustrated at left is for operation on a 330-kv, 3-phase, 60-cycle system. It is 26 feet high, weighs 41,000 pounds and covers a projected floor space of 92″ by 88″.

This tremendous unit would have been much larger physically without the basic design features proved in lower rated units and the continuous research into high-voltage applications. In addition, other basic design features include:

Interchangeable bushings

Condenser bushings on VP potential transformers (25 kv and higher) are interchangeable with those used on power transformers of the same voltage class. They give high mechanical strength—high puncture strength—with relatively small size and weight.

Hermetic sealing



Porcelain weather housing of bushings is solder sealed at the cap and flange. High-voltage bushing flanges are welded to the tank. All tank seams are arc welded. The security of all joints of the complete vacuum filled assembly is then proved by an oil-pressure test.

This "hermetically-sealed" construction assures sustained transformer accuracy necessary to the reliable measurement of high voltage at any level.

For more information on the most complete line of instrument transformers on the market, call your nearby Westinghouse representative or write direct to Westinghouse Electric Corp., 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

Iowa Electric Advances Arnold

Utility's operating vice president takes over general manager's duties of Pres Sutherland Dows

DUANE ARNOLD

Duane Arnold has been appointed vice president and general manager of Iowa Electric Light & Power Co.

In making this new appointment, Iowa Electric L&P announced that Arnold will relieve Pres Sutherland Dows of his general manager's duties. Dows has been serving the utility as both president and general manager.

In addition to his new duties, Arnold, who has been vice president in charge of operations, will continue as head of the operating department.

Since joining Iowa Electric L&P in 1946, Arnold has served as both district manager and operating coordinator. In August, 1950, he was named vice president of operations.

General Electric Reveals Staff Changes

General Electric Co has announced a number of staff changes.

William B. Wilson has been made manager of GE's industrial power generation unit; Donald J. Mayer, manager of GE Lamp Division's Bellevue, Ohio, lamp works; and Arthur C. Barr, manager of quantity consumer sales for company's Lamp Division at Nela Park, Cleveland, Ohio.

George M. Roy has joined the staff of the Atomic Power Study of General Electric's Atomic Products Division.

M. N. Halberg, formerly with General Electric industrial engineering section, has been made application engineer of GE's large motor and generator department. Halberg, a member of GE's organization since 1926, will be responsible for application engineering service relating to sale, design, manufacture, and servicing of the department's products.

James Helm has been named sales manager for mobile communication equipment and special accounts. From headquarters at Electronics Park, Syracuse, N. Y., he will direct national sales of GE two-way radio equipment. Helm, who began with GE in 1943, was appointed sales manager of special accounts earlier this year.

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J. B. Clapp, formerly product promotion manager of General Cable Corp, New York, has become associated with F. M. Ballou, manufacturers' representative with offices in Jersey City and Camden, N. J. Clapp will be in charge of all power company and railroad accounts in the Eastern territory.

Edward R. Lee, Jr, has been named power engineer for the Kaiser Engineers Division of Henry J. Kaiser Co. A veteran of more than 20 years in power plant engineering, Lee formerly was affiliated with Kisscik Co, and J. G. White Engineering Corp, both of New York.

J. E. Mueller, formerly residential and commercial sales manager of West Penn Power Co, has been assigned to the newly created position of manager of policy administration on the executive staff. In other appointments, **T. G. Allan,** a member of the headquarters staff since 1944, was advanced to manager of residential and farm sales. **L. S. Singley,** with the utility 17 years, was promoted to supervisor of electric farm and home services. **J. H. Mullen,** assistant manager of the dealer section, was elevated to supervisor of dealer services.

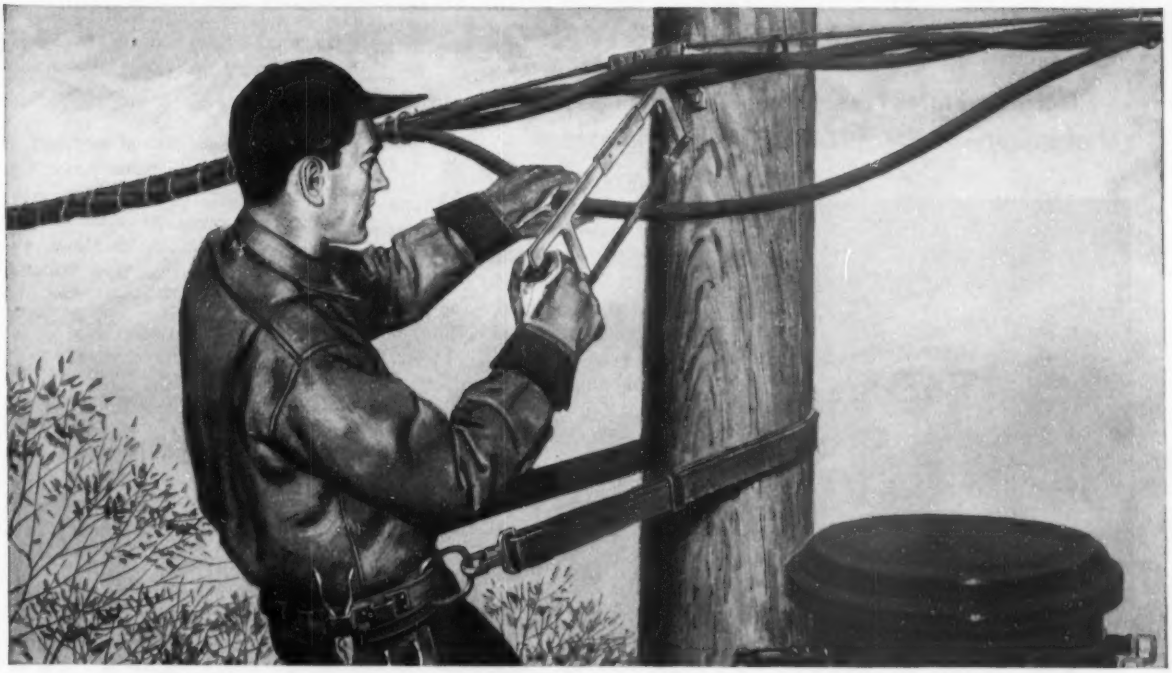
Dr John R. Dunning, a nuclear scientist and dean of engineering at Columbia University, has been appointed to the technical and engineering committee of the Dow-Chemical-Detroit Edison Atomic Power Project. Dr. Dunning is a director and a consultant of Vitro Corp of America, one of the 26 associated companies in the Dow-Detroit project.

John E. Lemmler, assistant to Niagara Mohawk Power Corp's commercial vice president in Buffalo, N. Y., has been made manager of the Angola (N. Y.) district to succeed **Albert L. Colvin,** who is retiring. Lemmler's successor is **Leo P. Morrissey,** office supervisor in the Tonawanda, (N. Y.) office.

S. F. Davies has been appointed sales manager and **C. B. Leape** engineering manager of the Micarta Division of Westinghouse Electric Corp. Davies, with Westinghouse since 1939, has been for the past four years manager of the commercial, industrial and floodlighting section of the Lighting Division at Cleveland. Associated with Westinghouse since 1940, Leape formerly was manager of the chemical application section of the materials engineering department.

Tacoma Board Chairman

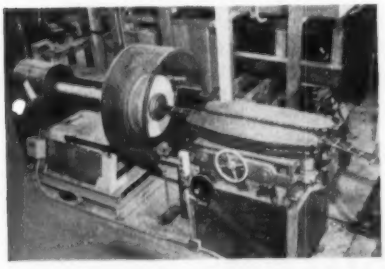
Tom W. Anderson has been elected new chairman of the Tacoma (Wash.) Public Utilities Board. Alfred J. Johnson was made vice chairman and Warren S. Lagerquist secretary. Anderson, co-owner of the Concrete Engineering Co, succeeds Gerritt VanderEnder in chairman's position, which rotates each year among members of the five-man board.



Connections are easier to make

WITH G-E REVERSE-LAY PREASSEMBLED AERIAL CABLE

General Electric reverse-lay preassembled aerial cable installed on the lines of Con Edison near Hartsdale, Westchester County.



Reverse-lay machine in operation at General Electric wire and cable plant in Bridgeport, Connecticut.

Each conductor of a General Electric reverse-lay preassembled aerial cable has sufficient slack, when unwound between reversal points, to make the necessary connections for transformers, cut-outs, or laterals. These reversal points are spaced five feet apart, so that one will always be within easy reach of a lineman on a pole.

G-E Super Coronol* aerial cable has the extra capacity needed for growing loads. The copper temperature rating up to 15,000 volts is 85 C, with an emergency rating up to 115 C depending on the voltage. Voltage regulation is improved because reactances are balanced and are lower than with an open wire line. As a result, greater load-carrying capacity is obtained with preassembled aerial cable on circuits where voltage drop is a limitation.

A preassembled aerial cable installation is stronger than an open wire installation because of the strength of the messenger. Preassembled aerial cable also gives you the advantages of minimum tree trimming and neater appearance because cross arms and insulators are eliminated.

For more information on G-E reverse-lay preassembled aerial cable for use on primary and secondary feeders, see your Wire and Cable specialist or write Section W135-827, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

** Registered Trade-mark General Electric Company*

Progress Is Our Most Important Product

GENERAL ELECTRIC

Willson Assumes New Post

Northern States Power promotes veteran employee to manager of operations. Jarchow and Ryan are elevated

E. A. WILLSON

Northern States Power Co has announced the promotion of E. A. Willson as manager of operations. Other promotions included the appointment of T. L. Jarchow as general superintendent of electrical operations for the company and R. M. Ryan as superintendent of transmission and distribution.

Willson's Duties . . . As manager of operations, Willson will be in charge of power production, electrical and gas operations, construction budget, safety and property protection.

Willson, who graduated from the University of Minnesota with an electrical engineering degree in 1930, started working for NSP in 1928 while still a student. While with NSP, he has filled various positions in the operating department, including protection engineer, superintendent of protection and electric maintenance, and assistant to the manager of power production and system operations. Prior to his latest promotion he was general superintendent of system operation since 1953.

Distribution Experience . . . As the new general superintendent of electrical operations, Jarchow will be responsible for transmission and distribution, protection and electric maintenance, as well as system operation. He joined NSP in 1928 after graduating from the University of Minnesota with a degree in electrical engineering. After serving in various distribution posts, he was made in 1951 general superintendent of transmission and distribution.

Ryan, who is also an electrical engineering graduate of the University of Minnesota, began with NSP in 1923. He has been traveling distribution engineer since 1929.

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Samuel B. Williams, assistant to the chairman of the board of directors of Sylvania Electric Products, Inc, will retire Aug. 31. Williams, an electrical engineer, joined Sylvania's lighting sales organization in 1947, becoming director of public relations two years later. In 1952 he was made assistant to the president and assistant to the chairman in 1953. Before joining Sylvania, he served as editor of Electrical World for ten years. Active in industry organizations, he was president of the Illuminating Engineering Society in 1944-45.

Ray O. Weems has been named chairman and **Racy C. Jones** vice chairman of the Oklahoma Corporation Commission. **Wilburn Cartwright** has been appointed to fill the unexpired term of late **Reford Bond** (EW, Aug. 23, p 201).

Arthur F. Lewis, former advertising manager of Simplex Wire & Cable Co, who has been retained on the executive staff in other capacities for some time, will retire on Sept. 1.

W. Dee Shepherd, formerly contract manager for the Atomic Power Division of Westinghouse Electric Corp, has been appointed sales manager for that division. An electrical engineer, Shepherd will be headquartered at the firm's Cheswick, Pa., plant.

Albert M. Capps, chief of operations at Bonneville Dam for the Army Corps of Engineers, has been appointed project engineer to replace Frank M. Lewis, new co-ordinator of operations and maintenance for multipurpose projects in the Corps' North Pacific Division (EW, Aug. 16, p 43). He was associated with Southern California Edison Co for five years before joining the Corps at the dam in 1937.

Murray T. Greer, district manager at Atmore, Ala., for Alabama Power Co, has been transferred to Eufaula, Ala., as acting vice president of the utility's Southeast Division. **T. M. Hand,** district superintendent at Bay Minette, Ala., replaces Greer as Atmore district manager.

Nicholas M. Veinmiller, Bonneville Dam power plant operator foreman, has been named Lookout Point Project powerhouse superintendent. He went to work for the Corps of Engineers in December, 1936. The project is in Williamette River Basin, Ore.

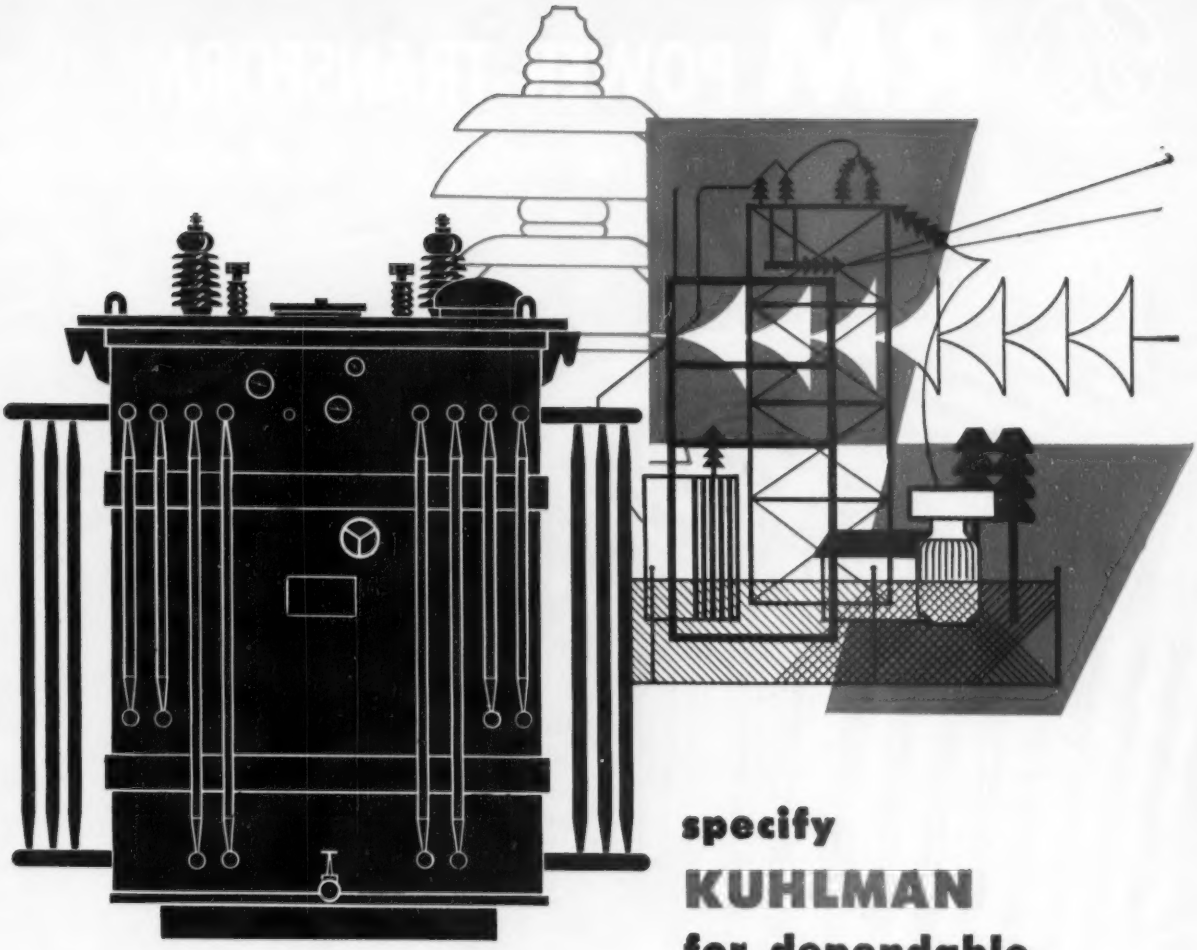
Division Manager

E. C. Jack Kimmons, Jr, who was made assistant Baytown Division manager earlier this year by Houston Lighting & Power Co, was elevated to manager of that division. Kimmons, who joined the utility in 1940, succeeds Nelson I. Bass, who returns to his former post as superintendent of the company's Western Division at Rosenberg, Tex.

OBITUARY

Percival R. Rutledge, 62, industrial engineer of Central Hudson Gas & Electric Corp, Poughkeepsie, N. Y., died Aug. 13 at Poughkeepsie. Rutledge, an electrical engineer, joined Central Hudson in 1924 as industrial power engineer and salesman in the utility's Newburgh (N. Y.) district. In 1945 he was appointed sales manager of industrial customers, becoming industrial engineer six years later. He was editor of an educational course entitled "Simplified Electricity for Utility Workers," and author of the book "The Story of Electric Service to the Farmer."

John F. McCarthy, 62, who served as head of the safety department of Central Illinois Public Service Co, died Aug. 12. An employee of Central Illinois PS for 38 years, McCarthy was named to the safety post in 1947 and personnel supervisor in 1951.



specify KUHLMAN for dependable power transformers

For more than half a century, Kuhlman Power Transformers have been providing a steady and dependable source of power for American utilities and industry. Built from finest quality materials and engineered for safe, economical operation, these units incorporate the latest design principles, many of which were developed by Kuhlman. Coils are dried under heat in vacuum to insure uniformly high insulation strength and then impregnated with thermo-setting varnish to provide good mechanical strength. Insulation is coordinated to the basic impulse level. Windings are equipped with wide oil ducts for insulation and ample cooling. Oil is introduced under vacuum to prevent entrapment of air and insure high insulation strength. Construction throughout is sturdy and rigid. Structural steel core clamps hold the core securely in place to prevent shifting or vibration and provide support for coil braces, lead guides and terminal structures. Tanks are constructed of heavy steel plate, and sealed to minimize deterioration of oil.

Kuhlman Power Transformers are assembled by men who are highly skilled in the electrical crafts. They are thoroughly inspected and tested to meet rigid quality standards. Kuhlman Power Transformers can be produced in a wide variety of ratings, with accessories to suit the specific needs of utilities and industries. For complete information, write for Bulletin CS-601. Kuhlman also builds Distribution, Dry Type, Saf-T-Kuhl, Subway, CSP and Series Street Lighting Transformers. Bulletins are available on these models as well.

151-T

KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • Southern Division, CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVE: INTERNATIONAL STANDARD ELECTRIC CORP., 15TH FLOOR, 50 CHURCH STREET, N. Y. 7, N. Y. CABLE ADDRESS: MICROPHONE, N. Y.

SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

RM POWER TRANSFORMERS

the benefits of ASA standards

RM* brings you all these benefits

Repetitive Manufacture gives you the economy of a standardized product, yet with optional ratings and accessories sufficient to meet most special needs. Ordering is simpler, shipment is many weeks faster, and prices are up to 8% less than those of nonstandard units.

**RM is the G-E designation for ASA-standardized power transformers 69 kv and below, 501 through 5000 kva single-phase, and 10,000 kva three-phase.*

LOWER PRICE

plus . . . . . **Superior rust prevention**

because Super Melaglyp paint finish lasts up to 150% longer

When you need a transformer in the medium range, order a G-E Repetitive-Manufacture transformer, and you'll get all the benefits of ASA Standards, plus exclusive features that give you better performance, easier handling and less maintenance.

SUPERIOR RUST PREVENTION, for example, is obtained with Super Melaglyp—General Electric's new outdoor paint finish. Lasting up to 150% longer than previous finishes, Super Melaglyp is applied to all transformers manufactured at G.E.'s new Medium Transformer Plant.

Completed tanks are first cleaned by blasting to remove scale and to prepare the surface for the application of the three-coat paint system. After leak testing, the tanks are given a primer coat pigmented with rust inhibitors to prevent corrosion and two finishing coats of Super Melaglyp. Each coat is thoroughly baked on at 150 C before the next one is applied.

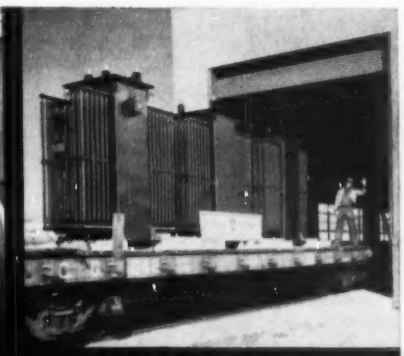
The result is the smoothest, most durable outdoor paint finish obtainable today. It protects equipment better and lasts longer — saving repaintings. Super Melaglyp averages 50% longer life. In salt and chemical atmospheres it has an increased resistance of 75% or more over the previous finish.

MANY OTHER BENEFITS result from the advanced methods and processes used in General Electric's new plant at Rome, Ga. These include high dielectric strength because vapor-phase drying removes entrapped moisture, stronger liquid-tight tanks because submerged-arc welding strengthens major tank joints, and quicker delivery from faster, conveyorized production. Built solely to produce power transformers in the medium range, this plant serves electric utilities and industry by turning out better transformers in shorter time. You can get full information about RM power transformers by contacting your nearest G-E Apparatus Sales Office, or by writing for Bulletin GEA-6108 to General Electric Co., Section 422-12, Schenectady 5, N. Y.

Progress Is Our Most Important Product

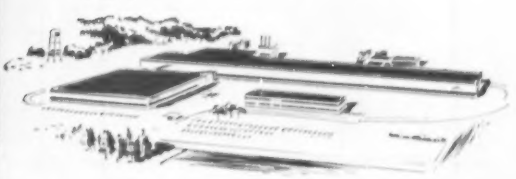
GENERAL ELECTRIC

SIMPLIFIED PURCHASING



SHORTER SHIPMENT

G.E.'s NEW, ROME, GA. TRANSFORMER PLANT—built specifically to meet the growing trend to standardized power transformers.



Pipe-Type Cable Line Has . . .

JOHN H. PALMER, Electrical Engineer, Phelps Dodge Copper Products Corp, New York 5, N. Y.

Two 110-kv pipe-type cables, installed recently by the Alabama Power Co. terminate inside power transformer tanks in a termination which is the first of its type in the United States. Similar terminations are in operation in England, Switzerland, and Italy, and Alabama Power has had somewhat similar 115 and 46-kv systems at the Gadsden, Ala., generating plant since 1949.

The new installation has two circuits with one pipe line per circuit from an overhead 110-kv supply at North Montgomery to the Jefferson Street substation in downtown Montgomery. There the circuits are stepped down to 12 kv for supplying power to the business district. Each circuit is approximately 1 mile long.

Each circuit consists of three single-conductor No. 4/0 AWG cables with 0.435-in. impregnated paper insulation. This cable is of the high pressure oil type without sheath so that the oil forming the pipe pressure medium can interchange with the cable impregnant. The cables are in steel line pipe 4½ in. OD with 0.237-in. wall, coated outside with Somastic insulation to a nominal thickness of ⅜ in. and inside with No-Oxide enamel.

Reasons for Installation . . . The 110-kv pipe-type cable system was decided upon for the following reasons:

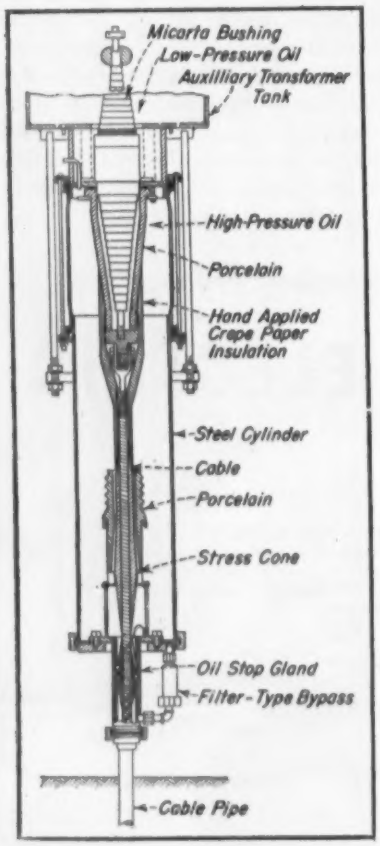
1. Overhead 110-kv construction was ruled out because of the hazards of such a system through a built-up area adjacent to the business area.

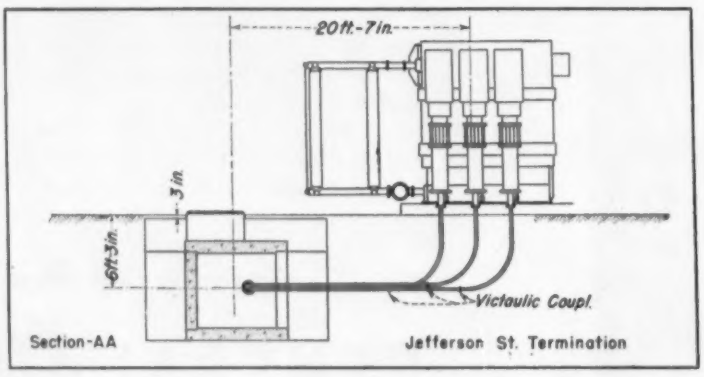
2. Proven reliability of pipe-type 110-kv cable installations.

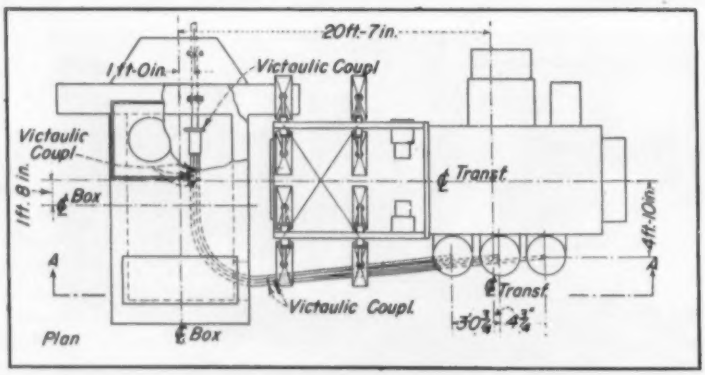
3. Over-all economy compared with other methods using lower voltage lines or cables.

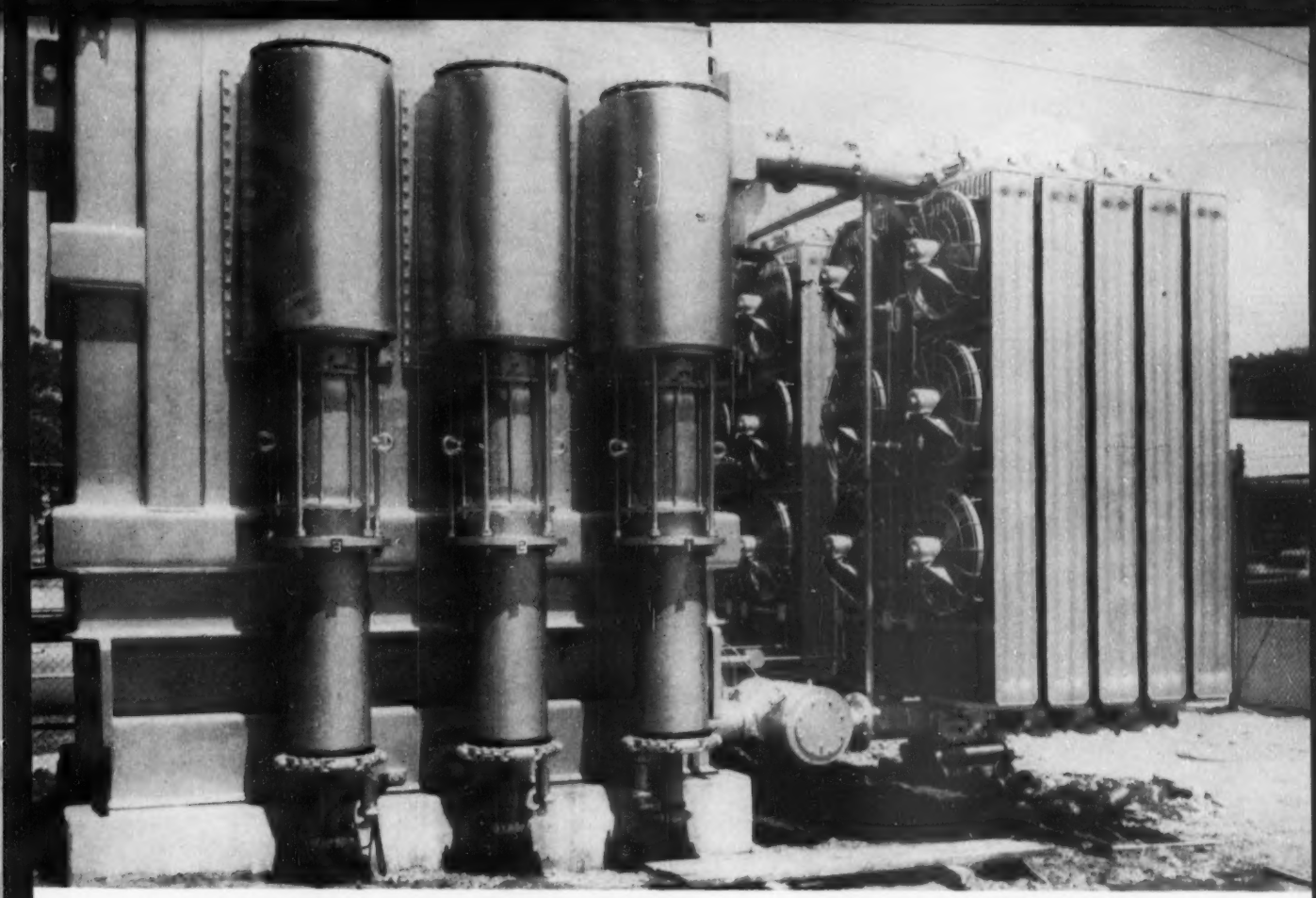
Installation Statistics . . . The summarized vital statistics of the installation are tabulated on the facing page.

Joints are all normal, through type, with section lengths averaging approximately 1,800 ft. Terminations at the North Montgomery end are of the usual type, with spreaderheads above ground and on oil-stop gland in each riser tube, bypassed by an external check valve to maintain oil in the terminal system in event of pressure loss in the line. High pressure-type, 115-kv potheads are used with oil-stop glands in their bases, bypassed by special filters assuring clean oil in









TERMINATIONS at Jefferson Street ends of line are in specially designed auxiliary oil-filled chambers mounted on sides of main transformer tanks, giving completely enclosed and shielded construction. Details of terminations are shown in drawings below on opposite page

Terminal Inside Transformer

the potheads. Oil pressure is maintained and controlled by the usual dual pumping unit.

Termination Design . . . The termination design at Jefferson Street resulted from collaboration between Westinghouse, suppliers of transformers and of cable. The particular type of termination was selected for these reasons:

1. The substation is in a heavily built-up area where open 110-kv buses are hazardous and undesirable.

2. The substation lot is small, and the use of transformer terminations for the cables reduced space requirements for the new installation.

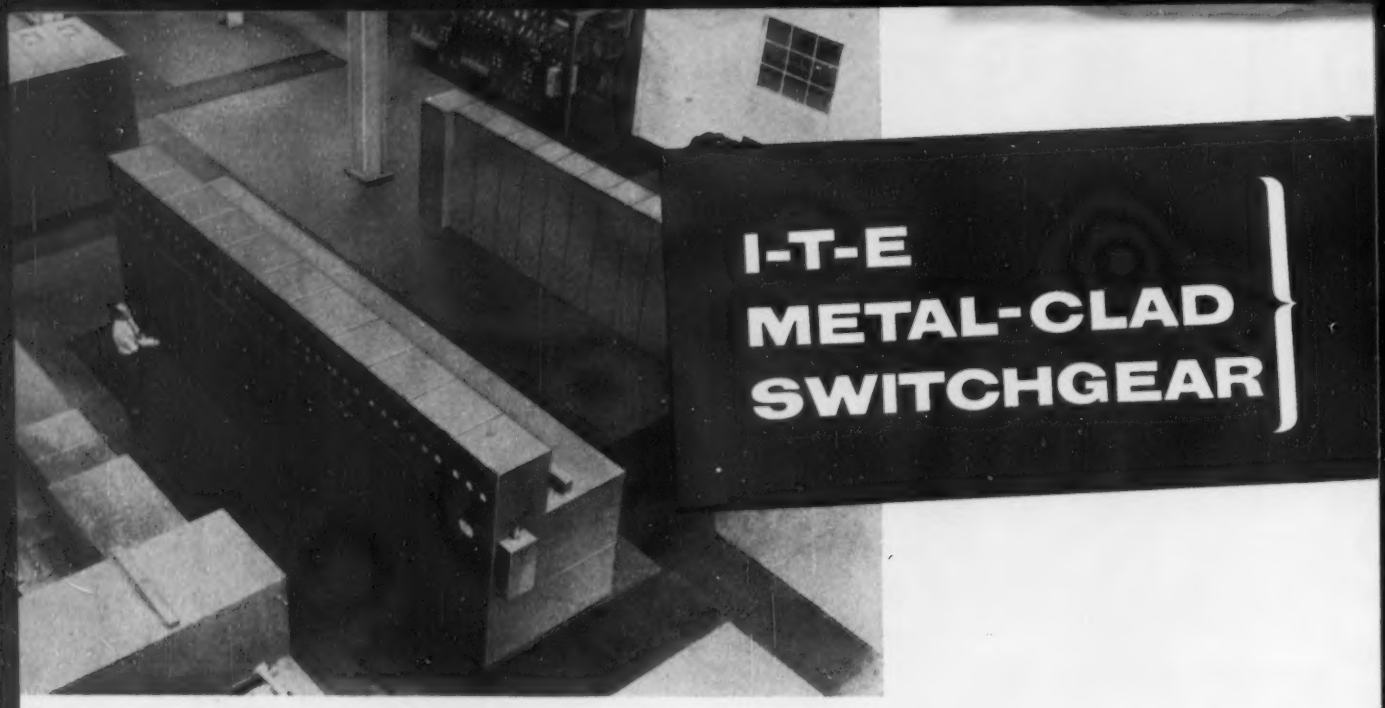
Accompanying drawings show details of the cable terminations at Jefferson Street. The main pipe line comes into a trifurcator where the three single-conductor cables are separated into individual copper tubes in a manhole. The cables are then carried underground to a point beneath the transformers, where they turn upward, leave the ground, and terminate in stop glands.

Filter Bypass . . . The stop glands are bypassed by a filter-type equalizer unit supplying oil to a steel cylinder, in which the cable is joined to a bushing-type termination extending into the auxiliary transformer tank. The cable terminates in an arrangement similar to a pothead which, in turn, is connected to a bushing. This connection, insulated with crepe paper, is under the full oil pressure of the pipe line.

The high-pressure oil system terminates in this chamber, and pressure on the bushing is carried externally on the porcelain. Ordinary transformer leads are connected to the top of this bushing which is filled with oil at atmospheric pressure. These leads are carried through a large opening directly into the transformer tank and to the windings.

Vital Statistics of Installation

Number of Circuits	2
Approximate circuit length	1 mile, each
Calculated load rating	56 Mva at 75% load factor
Number of pipes	2
Number of single-conductor cables per pipe	3
Rated voltage	110 kv
Conductor	No. 4/0 AWG, oval strand
Insulation	Impregnated paper, 0.435 inches
Outer coverings	Copper tape intercalated with moisture-proof tape, and skid wires
Steel pipe	API-5L, 4.5 in. O.D. x 0.237 in. wall
Grounded neutral	Yes
Cathodic protection	No



Your metal-clad switchgear is a *vital* purchase. That's why you should take advantage of the many advanced engineering features of I-T-E quality equipment. They add up to a sound investment which pays *extra* dividends for years and *years* in maximum electrical protection, control, and service continuity.

I-T-E air circuit breakers are the heart of your switchgear. With an I-T-E HV breaker you get *positive arc interruption* —the ultimate in air breaker performance. In just one instant of its lifetime, this rugged device can repay its cost many times over. In addition to superior breakers, the modern I-T-E switchboard incorporates the highest quality components and accessories.

I-T-E metal-clad switchgear is completely factory-assembled and -tested *before* it arrives at the installation site. Tight construction schedules are met by dimensionally accurate assemblies which need only be brought to their location and connected according to plan.

I-T-E extra-service benefits include application engineering aid in (1) selection and application of equipment, (2) preparation of specifications, and (3) coordination of all job requirements.

RATINGS

2400, 4160, 7200, 13,800 volts a-c
50,000 through 500,000 KVA interrupting
600 through 2000 amperes continuous

For details, contact the I-T-E field office nearest you. Look in your classified directory under "Electric Equipment," or write for Bulletin 7004B.

THE SYMBOL OF QUALITY SWITCHGEAR

I-T-E CIRCUIT BREAKER COMPANY

19th AND HAMILTON STS., PHILADELPHIA 30, PA.

METAL-CLAD SWITCHGEAR

engineered for •Protection •Safety •Accessibility

CHECK THIS ADVANCED I-T-E ENGINEERING:

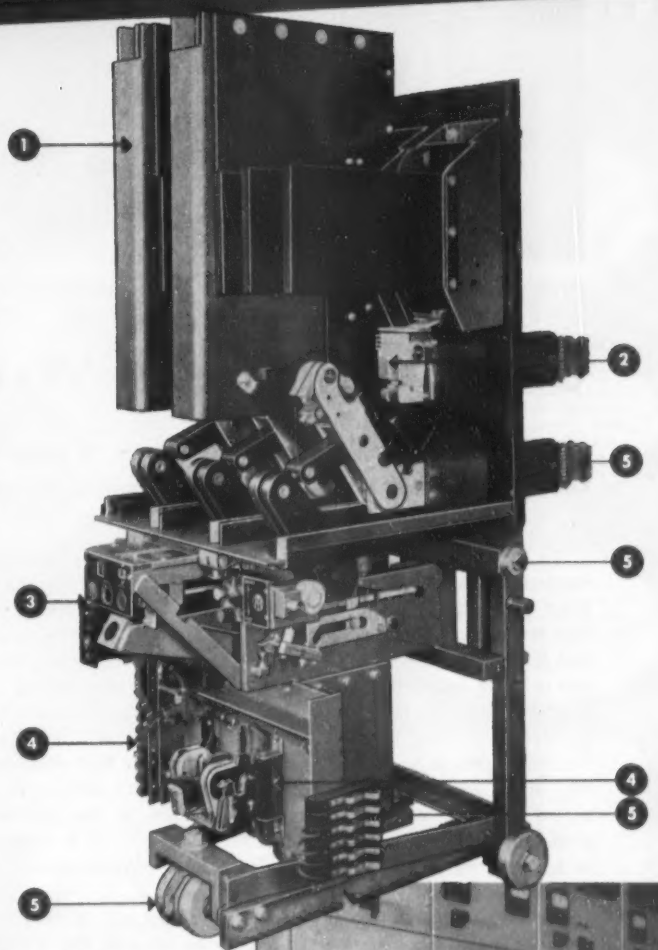
1. **Positive arc interruption** is provided by carefully designed arc chutes, contacts, and blowout irons.

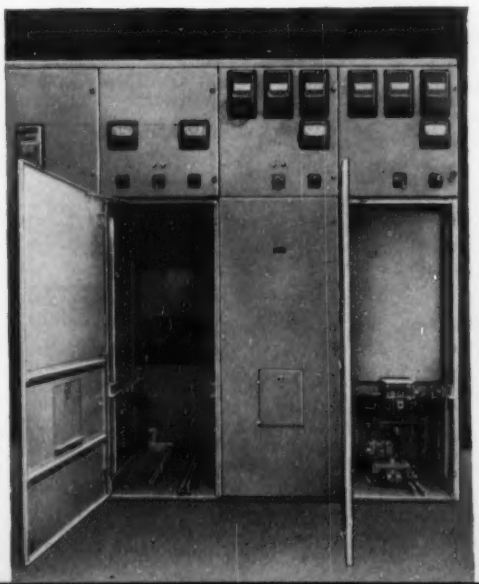
2. **Sturdy main and arcing contacts** are designed to minimize wear and deterioration due to arcing.

3. **Simplified testing** is achieved by centralizing electrical test button, manual trip button, breaker positioning device, and emergency breaker closing handle.

4. **Easy inspection and maintenance** is afforded by readily accessible secondary control relays, rectifiers, auxiliary switches, and separable contacts.

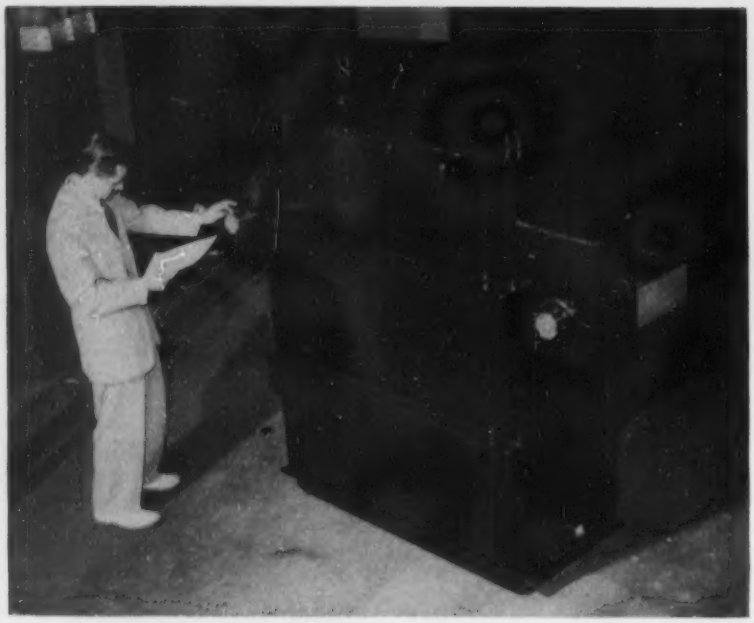
5. **Truck-type horizontal drawout** is facilitated by precision-made guide wheels, bar, and self-aligning contacts.





ACCESSIBLE COMPARTMENT DESIGN features wide-opening doors. Withdrawal of breaker closes grounded, steel shutters to protect personnel. Metal partitions completely segregate compartments. Instruments and relays are fully isolated from breakers, safe from jar and vibration—protecting against damage and false operation.

TO TEST BREAKER quickly and safely operator works through small auxiliary door—from *outside* compartment. Other safety features include complete interlocking of breaker operation, segregation of circuit wiring, proper venting of arc gases, and utilization of correct insulation materials.



TRANSFORMER will be submerged in Lake Ontario to supply electrically heated intake screen

Utility to Heat Lake Water . . .

. . . to prevent ice from restricting flow to condensing system. Rochester G&E installing special equipment in Lake Ontario

An electric "water heater" submerged in Lake Ontario is expected to solve a unique icing problem at the 190-Mw Russell Station of Rochester Gas & Electric Corp. The heating system is being installed at the intake of the condensing-water pipe to prevent ice from restricting flow.

Components to be located at the intake are a specially built electrically heated intake screen and a submerged power supply transformer. Power will be supplied by a 2.3-kv cable pulled through the pipe.

Decision to install the heater followed an investigation started last February when the flow of condensing water slowed down in the 3,600-ft long, 7-ft diam concrete pipe. Ice forming at the intake screen was determined to be the cause of the restricted flow, which curtailed the 115,200,000 gal daily flow and generation at the station.

No other utility in the country having a pipe extending so far out in the water and in such deep water (25 ft) was found to have experienced the same problem, according to Ralph McCumber, general manager. "Other utilities have experienced ice trouble," McCumber said, "but it has been principally with slush or floating ice which could be removed manually. In those cases, the intake racks were either close to the surface of the water or were near the shore."

To prevent ice from forming the company built four electrically heated screens to replace the 10 x 60-ft wood screen at the intake. Each screen measured 10 x 15 ft and is made of pipe having electric heater installed inside.

First step in the intsallation job will be to pull the 2.3-kv cable, which weighs 12½ tons, through the pipe. A small line tied to a metallic float will be sent from the intake to the station. Successively larger lines will be pulled in and finally the cable will be pulled through the pipe to the lake bottom.

A 2,300-440-v, 3-phase transformer normally rated at 300 kva will be submerged at the intake. Because the transformer will be rapidly cooled by the surrounding cold lake water, it will carry 1,000 kva.

The last step in the job will be to move the steel screens by barges to the point just over the intake where they will be carefully lowered into place. Entire job will require about three weeks.

Heaters will not raise the water temperature more than a fraction of a degree, McCumber said. However, application of the heat to the 32F water will be sufficient to prevent ice from forming. Heat will probably not have to be used more than a few days a year and perhaps not every year.

Atomic Study by Vitro Is Approved by AEC

Atomic Energy Commission has approved a proposal by Vitro Corp of America to study chemical and metallurgical processing problems linked with nuclear power systems.

This company-financed study is the first to be undertaken in the chemical and metallurgical field under AEC's Industrial Participation Program for development of competitive nuclear power.

Vitro will survey available industrial power studies and AEC's reactor development program to determine trends in processing requirements, most probable line of development, and most promising techniques. From its studies, the company will select one or more processing concepts for engineering analysis and preliminary design studies and make an estimate of processing costs relating to overall nuclear power economics.

Investigations to be carried out by Vitro's Engineering Division will include preparation of fuel, removal of fission product poisons, primary separation of material discharged from the reactor, recovery and reworking of unspent fuel, recovery and decontamination of fissionable material produced in reactors, and radioactive waste disposal.

After the one-year agreement expires, Vitro will report its findings for further development work to AEC.

St. Lawrence Engineer

William H. Latham has been appointed resident engineer in charge of construction of the St. Lawrence power project. He has been chief engineer of New York City's Department of Parks since 1936.

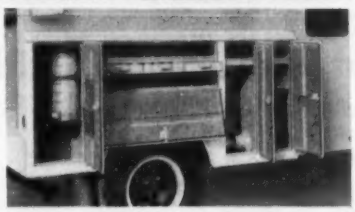
Another reason why
UTILITIES EXPECT MORE FROM POWERS *American*

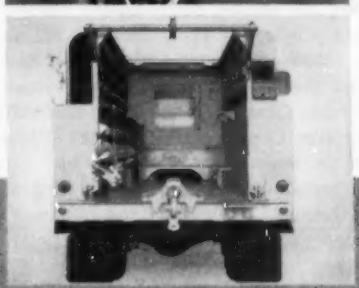
The Ultimate in Line Construction Equipment

MANAGEMENT
likes the 800-C because it saves man-hours—furnishes crew comfort—provides a safe, durable, low-upkeep unit for heavy work.

SUPERVISORS
like the 800-C because it's a completely equipped body that's easy to load—easy to use—easy to inventory.

CREW MEMBERS
like the 800-C because it keeps tools and supplies in easy-to-find order. And, with a Pole-Master, it's a lineman's dream.





All shelves and parts bins are standard equipment. Street-side doors open 180° for easy access to all compartment space.

Sliding drawers are furnished in curb-side compartments. All door locks are keyed alike. Crew enclosure seats four.

56" wide cargo area provides space for miscellaneous supplies. The body can be equipped to meet individual needs.

Utility operators indicate that the 800-C is destined to set a new standard for line construction vehicles.

It furnishes the storage space—the crew facilities—and the equipment for handling the most rugged types of routine or emergency line work. And, when equipped with a *Pole-Master* fully-powered, live-boom derrick—as shown above—crews can set poles up to 75 ft. in length.

The Series 800-C in 11′, 12′3″, and 13′ lengths—and the Series 800 (without crew enclosure) in 11′ or 12′6″ lengths—can be furnished with *Pole-Master* or conventional derrick.

COMPLETE DETAILS and prices are yours for the asking.

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SALES & SERVICE

200-W Lamps:

Majority of employees like to use them in their homes, Massachusetts survey shows

A recent survey of 1,100 employees of Western Massachusetts Electric Co revealed that 67% were pleased with the performance of the new smaller size 200-w lamp.

Each employee was given one of these new lamps several weeks ago to test his opinion of its scope and desirability. He was asked to use it for a month and then report his opinion as to whether residential customers would benefit from it and reorder such lamps. J. F. Burt, general sales manager, had charge of the survey and analyzed responses.

Employees found 17 different places in and around the home to use a 200-w lamp. The most popular location was the workshop bench light. Second most popular location was the living room lamp—with the kitchen lighting fixture a close third.

In many cases the new 200-w lamp fitted existing fixtures designed to carry the older 150-w lamp. While the larger lamp gives out more heat than the smaller units, 82% of the users failed to notice any excessive amount. A few criticized the heat dissipation. One contended that the lamp was too hot for a floor lamp equipped with a plastic indirect reflector, and a baldhead reported excessive heat while shaving.

Surgical Gloves Washed in Automatic Washer

That washday boon to the American housewife—the automatic washing machine—has moved into a Chicago hospital where it is washing soiled rubber surgical gloves faster, cleaner and cheaper than any method yet tried.

Some 40,000 pairs of gloves are laundered each month in three automatic washers at Cook County hospital, an innovation which officials say is saving hundreds of work hours and affecting dollar savings many times the initial cost of the machines. Work was formerly done by hand. Machines now release employees for other work.

Electric Utilities Back Wiring Campaign

Kennecott Copper Corp's current adequate wiring advertising campaign is receiving enthusiastic backing from the nation's electric utilities, reports Charles R. Cox, company president.

Kennecott already has filled requests for 40,000 reprints and 2,000 blowups of ads. The campaign schedule calls for eight insertions in two national consumer magazines and publicity plus advertising in several technical magazines to explain the program to the industry.

With four out of five private residences in America inadequately wired, the copper firm hopes the campaign will stimulate the re-wiring of homes thus opening the door to increased electrical equipment and power sales for every branch of the industry.

New markets for electrical products are presently closed, says the copper firm, since most homes cannot deliver the power to run them. Rewiring will bring new business to contractors, dealers, utilities and manufacturers. Finally, the sheet, wire, rod and tube manufacturers will benefit in increased sales of their raw products by a trend to home re-wiring.

General Electric Co photo

AVENUE OF THE AMERICA'S new mercury-vapor system in New York has 295 lamps mounted on staggered 28-ft steel poles. Not yet complete it already has helped cut mishaps 41%. Lamps, on upsweep brackets, shed 1.4 ft-c illumination at mid block

New Lights Help Slash Accidents

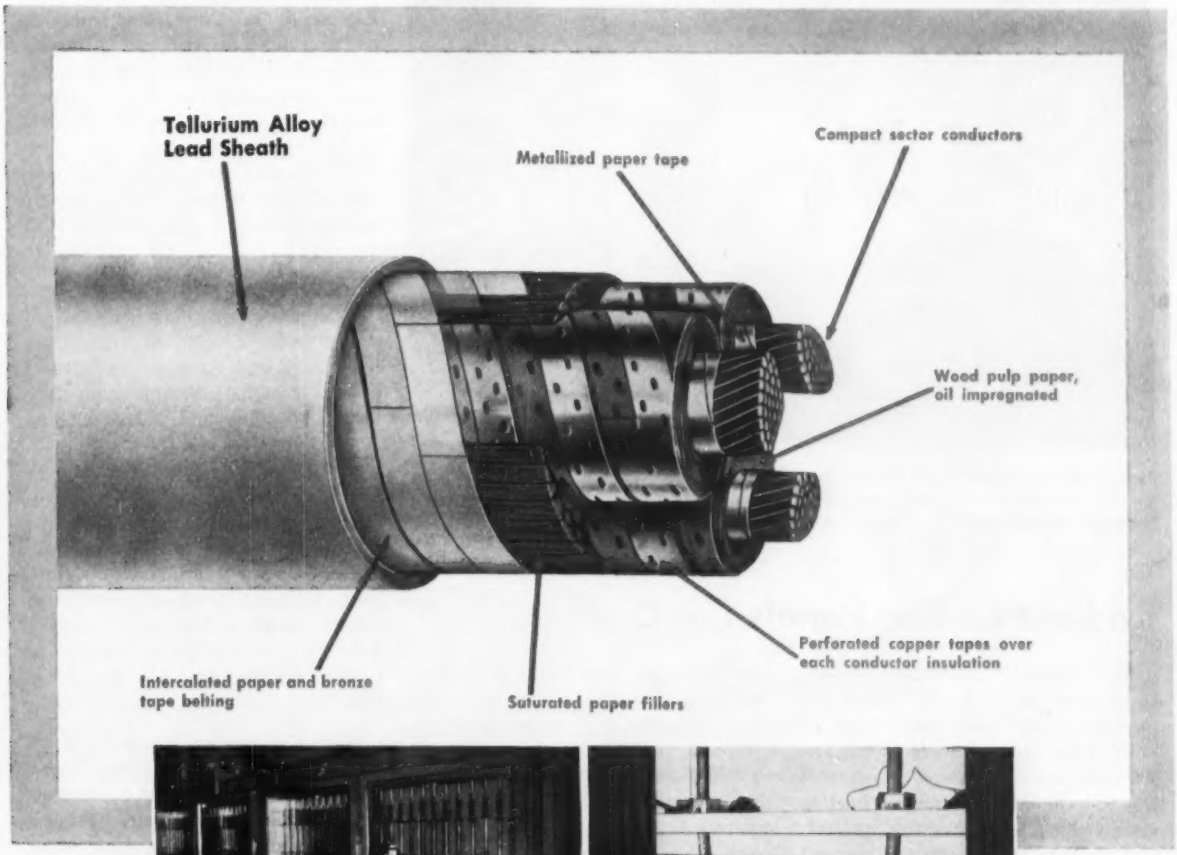
Better street lighting already is being credited with helping to nearly halve the number of traffic accidents on New York City's Avenue of the Americas even before the new system is completely finished.

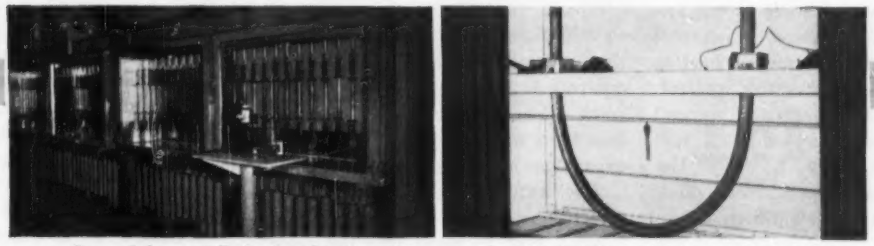
A 41% reduction in traffic mishaps has been chalked up during the first half of 1954 along the street's newly-lighted section between 32d and 59th Sts. The city as a whole has experienced a 2% increase in accidents and injuries in the six months compared with the first half of last year.

When completed this fall, the street's new system of 295 mercury-vapor lights will extend from Greenwich Village to Central Park and on side streets adjacent to Rockefeller Center (EW, Dec. 28, 1953, p 67). It is being built by the Avenue of the Americas Association, Inc.

Lights provide initial illumination of 1.4 ft-c at midblock with higher intensities at intersections. They are being mounted at a height of 28 ft on steel poles staggered and spaced 70 ft apart. Lighting units themselves are mounted on upsweep brackets eight ft long giving a light center of 27 ft. Each unit utilizes a luminaire with a 20,000-lumen color-improved lamp.

FOR INCREASED LOAD REQUIREMENTS...PAPER INSULATED CABLE WITH TELLURIUM ALLOY LEAD SHEATH


Tellurium Alloy Lead Sheath
Metallized paper tape
Compact sector conductors
Wood pulp paper, oil impregnated
Perforated copper tapes over each conductor insulation
Intercalated paper and bronze tape belting
Saturated paper fillers



Some of the specially-developed testing equipment with which Roebling maintains quality control of the production of Tellurium Alloy Lead Sheath. #1 Temperature control ovens for creep test of strips cut from tellurium alloy lead cable sheathing. #2 Temperature control oven for bending fatigue test of full cable section.

YOU'LL REALLY solve power cable headaches with Roebling Paper Insulated Cable with the new Tellurium Alloy Lead Sheath*, a Roebling exclusive. Here are some of its outstanding advantages:

1–Tellurium Alloy Lead Sheathed Cable has a lower long-time creep rate;
2–Extra high fatigue resistance;
3–High bursting strength;
4–Exceptional stability under heat application as in duct splicing and wiping;
5–Abolishes need for frequent stop joints or reinforced lead sheath;
6–Doesn't require generous expansion bends or large manholes;
7–Heat application in splicing leaves its desirable properties unimpaired.

WRITE US FOR FULL DATA. John A. Roebling's Sons Corporation, Dept. 707, Trenton 2, N. J.

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SUBSIDIARY OF THE COLORADO FUEL AND IRON CORPORATION

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United States Rubber Co Photo

BARELY VISIBLE on the ceiling of this studio bedroom in new motel, electric radiant panels provide year-round heat. Panels are glued to ceiling and are controlled by thermostats. Electrical connections fit neatly into wall moldings.

Radiant Ceiling Panels Cut Costs

Thin panels of electrically conductive rubber, glued to the ceiling, are providing year-round heat for all 42 units in the new Belvedere Motel, San Antonio, Texas. "These panels cost less to install than a central heating system and give comfortable, radiant, soot-free heat that eliminates the need for redecorating every month," said Col Joseph Garmack, owner. "The panels do away with radiators, pipes and ducts. They also allow us to use all our floor space, and make the rooms seem larger. There is also a safety factor, because they are out of the reach of children. Adequate heat is possible in 20 min with the panels."

The panels are made of paper-thin sheets of specially-compounded rubber that conducts electricity, sandwiched between sheets of aluminum foil and plastic.

Although the San Antonio area is generally regarded as a warm part of the country, the temperature has been known to dip to 5 deg above zero. For such cold spells, or at any time during the year, the panels are said to provide heat quickly. It is claimed that tests show that the panels can be expected to last as long as the building. In addition, they require no maintenance. The panels are made in three standard sizes up to 4 by 6 ft and weigh only 6 oz a square foot. They are rated at 22 w per sq ft (75 btu), and are made for use with 230 or 115-v systems. They are glued to the ceiling with special adhesive and controlled by thermostats in each room. When in use, their entire surface heats up uniformly to provide an even, "sunshine-type" of heat.

The heating panels are used in the three rooms of each unit, and they are painted over to blend into the color scheme. The rooms are also equipped with air conditioning units and exhaust fans. Heat panels are also being used in the public lounge, the manager's office and the housekeeper's quarters. In all, about 300 panels are used.

REA Energy Sales Grow

Energy sales of rural electric systems financed by Rural Electrification Administration now are running more than $1 million a day, according to the Department of Agriculture. This represents a ten-fold growth in the last 12 years, REA officials noted. Increase is due to higher power use and growth in number of farm consumers.

S & S Shorts

New Wrinkles . . . With a large share of its rural customers engaged in dairy farming, New York State Electric & Gas Corp (Binghamton) is carrying out a campaign to encourage greater use of milk. Newspapers, radio spots, display cards at appliance and farm equipment dealers, plus TV kitchen show complete with give-away milk-dish recipes are being used. Utility wisely believes that by helping its customers, it helps itself.

You'll Want to Write for: "Food Freezing Facts", a 32-page "how-to" booklet on preparation and use of frozen foods. Section on freezer care is included, too. Samples available on request from Commercial Dept., Edison Electric Institute, 420 Lexington Ave., New York 17. . . .

"15 Home Lighting Ideas", a new packet of data sheets for architects, interior decorators and utility specialists. It shows latest lighting techniques for variety of home areas complete with construction, installation details. Single packets are $1. Order from Publications Office, Illuminating Engineering Society, 1860 Broadway, New York 23.

New Campaigns: Westinghouse is spending $½ million on 60-day home freezer promotion through September. Besides newspapers, Betty Furness on TV and point-of-purchase material, concern will push sales with "Freezer Party," selling demonstrations through distributors and retailers. . . .

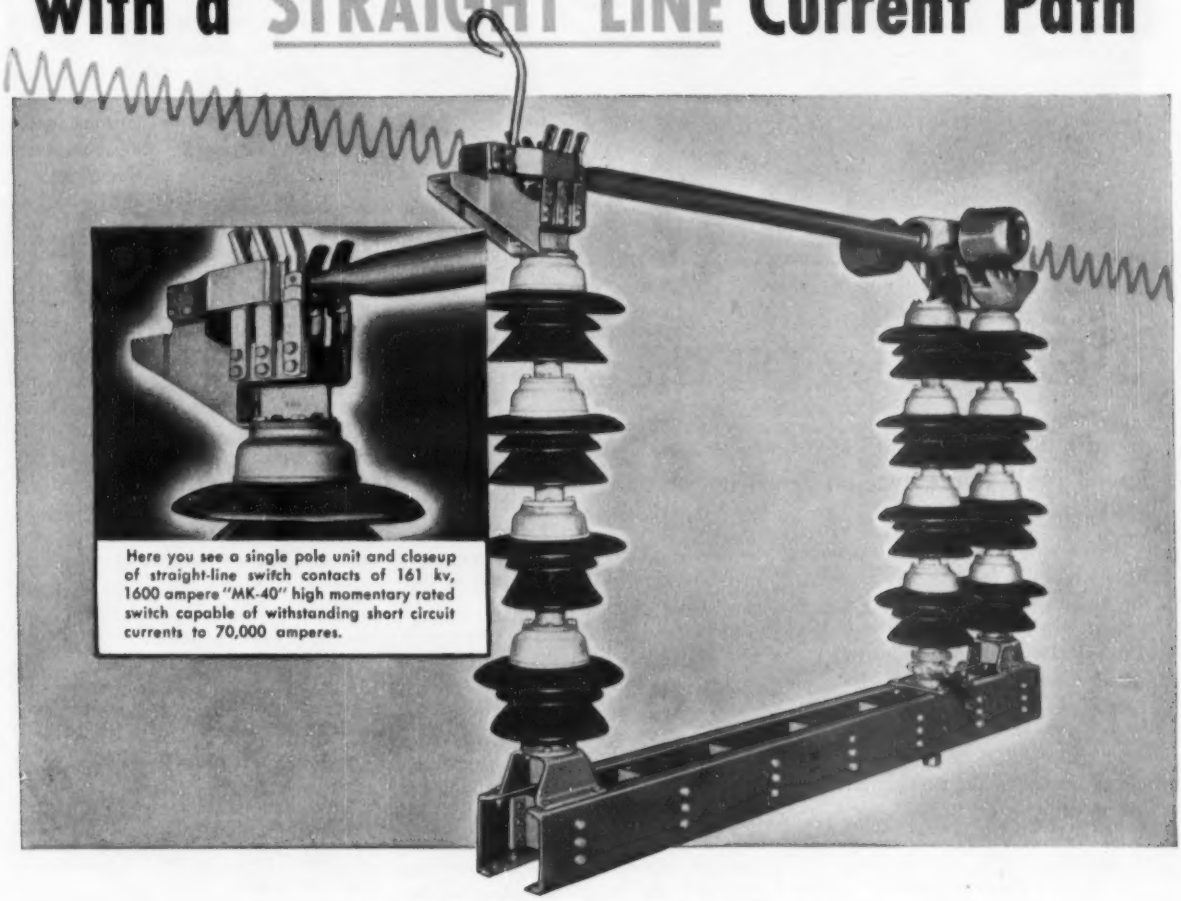
Landers, Frary & Clark (Universal) is gunning for fall and Christmas electric housewares business with a "Pace Setter" program to run through December. Heavy magazine and newspaper advertising will be used plus introduction of new electric blanket, lightweight iron, steam and dry travel iron and 10-cup Coffeematic.

New Products: Pryne & Co has new infrared heater for bathrooms. Heater is recessed fixture installed between ceiling joists and available in one and three-lamp units using standard R-40, 250-w infrared lamps. . . .

Sylvania Electric Products, Inc. offers choice of six colors in new line of 150-w reflector lamps designed for special effect and mood lighting. Maker claims colors—baked inside—will not fade, chip or peel.

Safely handle heavy short-circuit stresses

with a STRAIGHT LINE Current Path



Here you see a single pole unit and closeup of straight-line switch contacts of 161 kv, 1600 ampere "MK-40" high momentary rated switch capable of withstanding short circuit currents to 70,000 amperes.

Use DELTA STAR's New high-momentary-rated MK-40 Air Switches

With increasingly heavy loads on power systems, your air switches must safely withstand very high short circuit currents. DELTA-STAR's new, complete line of MK-40 Switches are designed to meet this problem. For example, the new 161 kv, 1600 ampere switch has a momentary rating of 70,000 amperes.

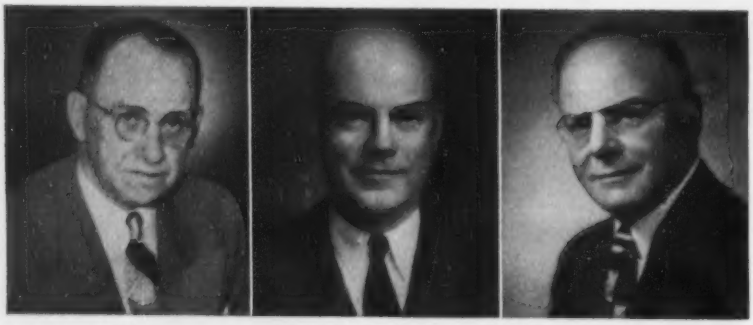
The straight-line MK-40 current path from terminal to terminal reduces current interchange surfaces. It avoids danger of blade opening due to magnetic forces encountered during short circuits.

Rugged contact construction at both clip and hinge ends prevent contact burning. Hard drawn copper contact shoes with heavy silver inlays at points of contact, and strong multiple leaf berrylium springs that provide heavy contact pressure, contribute to maximum contact efficiency.

DELTA-STAR MK-40 Switches are now available in all NEMA ratings from 7.5 to 330 kv, 400 through 5,000 amperes. Specify DELTA-STAR the next time you need switches.

DELTA-STAR ELECTRIC DIVISION

H. K. PORTER COMPANY, INC.
OF PITTSBURGH
2437 Fulton Street • Chicago 12, Illinois
District Offices in Principal Cities



R. C. SIMPSON J. W. PARKER A. S. KING

3 to Address EEI Group

Industry leaders will speak at luncheon meetings of Annual Round Table Conference on industrial relations, Sept. 27-29

Three well-known utility speakers have accepted invitations to address the luncheon meetings of the Annual Round Table Conference of the Edison Electric Institute's Industrial Relations Committee to be held at the Palmer House, Chicago, Ill., on Sept. 27-29 (EW, Aug. 16, p 62). This was announced last week by D. A. Bartlett, chairman of the subcommittee in charge of the program.

The speakers and their topics are as follows:

- "Light's Diamond Jubilee," James W. Parker, former president of the Detroit Edison Co.
- "The Employee Looks at Management," Robert C. Simpson, manager of the industrial relations service department of Gilbert Associates, Inc, New York.
- "Management Looks at the Employee," Allen S. King, president of Northern States Power Co, located in Minnesota.

Parker, now retired, who has been with the Detroit Edison Co since 1910, will sketch typical men who have made major contributions in the various areas of the electric industry since its inception. He will also touch on future developments in the industry.

Simpson, through his long period of experience in dealing with the employee and management, is well qualified to cover the subject for the employees. For over 30 years he has occupied various positions in the public utility field. In his talk he will outline employee criticisms of management along with what employees expect from management.

On the third day the conference will hear King who began his utility career with Northern States Power working in the summers. He joined the company as construction engineer in 1922 after graduating from Massachusetts Institute of Technology. He has a thorough understanding and sympathetic attitude to the problems of rank and file employees. He considers the value of employee relations as being just about tops in its application to all phases of the company's business, including public relations, finance, expansion, and operation.

BCE Agrees to Wage Hike; Fails to Sign 2-Year Pact

British Columbia Electric Co has decided to pay its 250 gas employees in Vancouver and Victoria, B. C., the new rates asked by their bargaining agents, International Brotherhood of Electrical Workers, but it refuses to sign the two-year agreement.

The 13% pay hike granted to the gas workers by BCE brings their basic hourly scale up from $1.37 to $1.47 for this year. A further 2% increase next year will boost the rate to $1.50 per hour.

BCE objection to the certification of the IBEW as bargaining authority for the gas workers centers around its claim that one union should not have full power over workers in another group. The company has filed an application in Supreme Court asking the Labor Relations Board to explain its certification of the electrical workers union as agent for the gas workers.

A. E. Grauer, Vancouver, president of BC Electric, made the following press statement:

"The BC Electric believes in industrial organization and for many decades has had collective agreements on an industrial basis. However, we do not think it is in the public interest that one industrial union, in our case the electrical union, should also have full power over another industrial union, in our case the gas workers.

"We intend to test this proposition to the extent allowed by the law. As subordinate matter, but still an important one, we have on the basis of experience, no confidence in the present left-wing leadership of the present electrical workers union."

Tacoma Light Launches Safety Driving Program

City Light at Tacoma, Wash., has instituted a program to train new drivers and check on driving habits of older personnel.

The program includes a written examination and a driving test to determine a driver's reaction time, smoothness of operation, judging of distance, etc. Drivers thus can learn their weaknesses and strive to correct them.

The program also has value as a public relations effort, Gordon Tatum, personnel director, declared.

"If you see a driver in a city owned car observing all the rules of safety and extending courtesy to other motorists, you're going to feel much better than if he acts like the rules don't apply to him," said Tatum.

Scranton Raises Wages

Scranton Electric Co and Utility Workers Union of America, CIO, have negotiated a 3% pay increase, effective Sept. 1. Rise was agreed upon under a first anniversary wage reopening clause in the current two-year contract.

There's no room inside for "frozen" thinking. For steam power progress will be measured in the future, as it has been in the past, by a lack of inhibition characteristic of Americans when they face engineering and financial problems.

No matter what you do, no matter what you make, the heat, light, and power you need must in large part come from coal, oil, gas and other fuels. And steam will be the medium for transforming the energy in those fuels into useable power. That's why it is important to you that B&W engineers tackle each new job with the determination that it can and must be an improvement over the excellent jobs that preceded it. Their thinking about how to give you cheaper power is not hampered by "sacred-cows" or slavish obedience to past practice.

Today, plants all over America are operating more efficiently because of B&W steam-generating improvements like Cyclone Steam Separators, coal pulverizers, advances in oil and gas firing, Cyclone Furnaces, pressure firing, high-temperature alloy steels, shop-assembled steam generators, use of increasingly higher pressures and temperatures, and waste-heat boilers and similar heat recovery equipment.

The door is open for tomorrow's contributions to the remarkable science of steam generation. You can rest assured that B&W engineers will continue to pioneer in the search for better ways to convert the raw energy which lies dormant in coal, oil, gas and other fuels into high-level, useable energy for the common good.

BABCOCK & WILCOX
BOILER DIVISION

N-183

See, Teach?

Six teachers taking a summer course at Arizona State College are shown getting some practical information that they can relay to their students in the fall

Arizona Public Service Co serves as a college

SIX FROM A SUMMER SCHOOL CLASS at Arizona State College supplemented sessions (above) with 40 hours a week at Arizona PS

TEACHER-STUDENTS spent a day at one of company's seven neighborhood offices to study handling of customer relations and service

That's How We Make a Kwhr

laboratory for high school instructors

Arizona Public Service Co offices in Phoenix are a combination utility company headquarters and college laboratory this summer.

The Arizona utility, in cooperation with nearby Arizona State College, is serving as an observational laboratory for six high school teachers who are taking a summer school course entitled, "Observation and Directed Practice in Business."

The teacher-students are putting in a regular 40-hour work week at the company in addition to two evening classroom sessions a week at the college.

During their five weeks at the company, the teachers spend some time in almost every phase of operations, observing the various techniques employed on the jobs.

They began by receiving a general orientation on the company, plus a tour of the properties.

Detailed discussions with department heads during their term cover employment practices and procedures, apprenticeship program, employee benefits, safety, labor-management relations, all phases of customer service operations, sales promotion and advertising, public information, and the various functions of the treasury department.

William Ismay, personnel manager for Public Service, feels such a program is a means of maintaining close relations between business firms and educational institutions.

"This cooperation with Arizona State College," said Ismay, "will give local companies a much closer contact with those responsible for instructing high school students in fields dealing with secretarial work and general office procedures and methods."

Other firms in the Phoenix area, principally banking institutions, are participating in the program.

Ismay added that as new ways of doing things are put into effect in Phoenix business offices, teachers will be able to adapt their commercial courses to these methods. In this manner, high school students will be kept abreast of modern business methods.

For their time with the company the teacher-students receive $200, plus three hours of college credit for the course.

The teachers like the utility seminar and their feeling might be aptly summed up in the words of one of them, who stated: "What I have learned at Public Service this summer would be equal to two years as student in a college classroom."

ORIENTATION TOUR of facilities was part of group's training (left). It wasn't all work—student who owned his own plane (above) flew some of his cohorts over Arizona PS service area

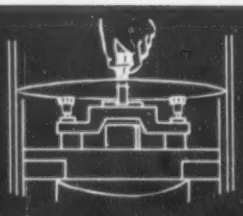
CUSTOMERS
RESISTANCE SEAM WELDED
SEALING MASTIC
Corprene tank seal gasket completely retained by welded-in retainer ring which serves as stop for gasket and groove for splashed oil. Gasket not cemented so it can be used time and again.
Tank base is pressed into tank shell and resistance seam welded. A sealing mastic compound is applied and the extending portion of the tank base is rolled in to provide protection against mechanical abuse.

BY THE ACRE

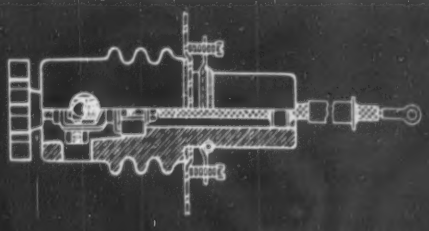
The housing developments springing up in every community have brought customers by the acre. Operating headaches by the acre have in turn been brought to distribution engineers. Feeders have to be extended . . . new substations put into service . . . secondary systems hung and put into operation quickly. For these new customers want, and expect, dependable service.

Design greater dependability into your distribution systems . . . eliminate voltage problems . . . build better customer relations by installing Moloney Distribution Transformers. To give your customers the service they deserve and assure your system of better service with less maintenance . . . make it Moloney all along the line.

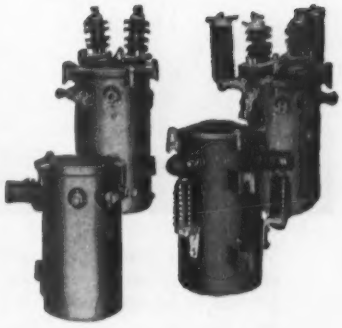
MEE4-15



Positive action tap changer with operating handle located above hot oil level. Double-moving contacts snap into position with a wiping action that assures positive contact.



Moloney sidewall mounted high voltage bushings suitable for working "hot" with a molded high impact resistant phenolic-gold rubber protective cup.



Moloney HiperCore Distribution Transformers are available in all standard ratings from 3 Kva up in both Conventional and CSP designs.

MOLONEY ELECTRIC COMPANY

Power Transformers • Distribution Transformers • Step Voltage Regulators • Regulating Transformers • Load Ratio Control Transformers • Unit Substations • Network Transformers • Constant Current Transformers • Capacitors • Transformers For Electronics

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA

it's time for a new meter...

when Mrs. Steele gets her all electric kitchen

When Mrs. Steele is busy in her all-electric kitchen, she uses many convenience outlet appliances at the same time. This often proves to be too much for a meter *not built* to measure modern loads.

The new Sangamo J2 Meter is designed to measure not only today's loads but the loads of the future because it has plenty of reserve capacity . . . straight-line accuracy up to 100 amperes.

Corrosion-resistant materials and finishes, an oilless, maintenance-free bearing system and low disk speed all add up to extra long life.

Choose the new Sangamo J2—the first . . . and finest . . . 15 ampere meter with 100 ampere capacity.

A METER WITH STRAIGHT LINE ACCURACY

UP TO 100 AMPERES

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

JM54-9

Power Breakers

Get new ASA standards reflecting current use of higher interrupting capacities

Four revised ASA standards on power circuit breakers are now available, covering the entire range of breaker types and ratings in current use, states V. L. Cox, chairman of American Standards Association Sectional Committee on Power Switchgear, C-37. (General Electric Co., Phila., Pa.).

The rapid tempo of development in breakers of higher interrupting capacity (max. 25 million kva to date) and operating voltage during the last two or three years has posed many problems to the sectional and subcommittees.

Major objective of the ASA committee has been to develop standards for new breakers in the high ranges of interrupting capacity and voltage not covered by the previous standards. Many other matters have received careful scrutiny resulting in new and revised standards. Among these, the following are some of the more important:

1. New or clarified definitions of terms have been devoloped to provide a firmer ground for understanding the intent of rating, application, and testing standards.

2. Temperature rise standards, previously established only for oil circuit breakers, have been developed for oilless breakers.

3. A complete section has been added covering a simplified method of calculation of fault currents for the benefit of application engineers.

4. Standard name plate data has been broadened in scope to include all significant rating data needed to apply breakers properly.

5. The Test Code has been completely rewritten to classify the tests made on circuit breakers into two categories: (1) Design tests, and (2) production tests. The purpose and accepted methods of conducting each of the tests are clearly described, providing a sound basis for understanding between the manufacturer and user.

6. Complete rules for the determination of interrupting rating factors for reclosing duty have been established, supplemented by a convenient tabulation of factors for the more commonly used reclosing cycles.

The economic significance of power circuit breaker standards can be appreciated from the fact that the annual industry sales of power circuit breakers is presently of the order of $250 million. Since the first issue of these standards in 1945, the total number of standard ratings has been reduced from 121 to a present total of 76, and the range of voltage and interrupting ratings covered has been considerably extended. The economic saving resulting from this kind of standardization, while difficult to evaluate accurately, is obviously very substantial.

Savings . . . Standardization has kept costs from rising as they would have without the program.

A project to establish a new and simpler method of defining the interrupting performance of all types of circuit interruptors is being actively promoted by the AIEE Committee on Switchgear with the objective of providing a basis for interrupting ratings which will meet with International approval, and at the same time simplify the work of the application engineer.

The four standards that complete the series of American Standards on ac power circuit breakers are: (1) American Standard Alternating-Current Power Circuit Breakers, C37.4-1953; (2) Methods for Determining the RMS Value of a Sinusoidal Current Wave and a Normal-Frequency Recovery Voltage, C37.5-1953; (3) Schedules of Preferred Ratings for Power Circuit Breakers, C37.6-1953; and (4) Test Code for Power Circuit Breakers, C37.9-1953.

L-M's Recloser Goes Mobile

Line Material's Type R Recloser will be demonstrated throughout the country during the next 12 months. According to R. C. Kirk, Manager, Kyle product sales, two mobile display units will each travel 30,000 miles by the end of the tour. Each mobile unit contains a complete heavy-duty 3-phase, 14.4-kv Type R recloser.

Hotpoint Puts in World's Largest Enameling Furnace

Hotpoint Co, Chicago, is installing the world's largest enameling furnace and some seven miles of "upstairs" conveyor lines in its home laundry machine manufacturing plant, according to John C. Sharp, president of the company. In his six-month progress report he states that more than 50% of the 1954 scheduled modernization work has been completed.

Sharp said that construction of the new plant follows the same basic pat-

tern as the company's new refrigerator plant and electric range plant. Such construction, he reported, permits in-line manufacturing operations, eliminates the use of columns, increases production efficiencies, and utilizes every inch of floor space.

Electronics Division Formed By IT&T

International Telephone and Telegraph Corp has formed a new domestic research and manufacturing division, the Farnsworth Electronics Co, at Fort Wayne, Ind. The new company will take over and expand the research and production activities in the fields of industrial and defense electronics formerly carried on by the Capehart-Farnsworth Co, and will enter the fields of advanced electronics and the application of atomic energy to industry.

Former Capehart-Farnsworth officials staff the new company. Dr. Harvard L. Hull is president. Philo T. Farnsworth will be vice president and technical director. W. F. Hoeppner has been appointed vice president.

MANUFACTURING BRIEFS

Metals . . . Copper buyers fear a squeeze in the wake of spreading strikes. All production operations of Kennecott Copper Corp were at a standstill, including the Braden mine in Chile. Anaconda and American Brass also shut down last week. A rise in price of refined copper above 30¢ a pound is not anticipated as the strikes are not expected to last long, and because of competition from plastics and aluminum . . . A west German concern, Moncagesellschaft MBH, has offered to put up $2 million towards installation of a copper smelting plant at Santiago, Chile.

Aluminum . . . Reynolds Metals Co and Kaiser Aluminum & Chemical Sales Inc have both announced a price boost to 20½¢ a pound for 99% aluminum pig . . . Production in July set a new peak, 252,323,794 lb . . . The Office of Defense Mobilization made official the rumors on cancellation of a third round of expansion for primary aluminum production. Domestic capacity now reaches 1,540,000 tons, estimates of Canadian production are up, and stockpiling has increased, while need for aluminum for military programs has decreased. The O. D. M. said that sufficient aluminum should be available for a number of years of war, allowing ample time to develop additional primary facilities should they be needed.

Foreign notes . . . Australia: Absence of power shortage has increased demand for household appliances. Imports have considerably increased; electric stove production is up 60%; refrigerator production exceeds 250,000 units. . . . Marley Co of Kansas City will install a cooling tower for the Latrobe River at Yallourn, the brown coal center of Victoria. It will cool 11,000 tons of water per hour. Two 220,000-v circuit breakers made by the British Thomson-Houston Co Ltd have just been installed at the Yallourn station. . . . **The Swiss** firm of Escher-Wyss in Zurich is building what they believe to be the worlds largest pumps: two accumulation pumps of 83,000 hp each for the Austrian hydroelectric plant Tawern Kraftwerke Zell am See

. . . **Russia** claims production increases over last year for motors of 15%; hydrogenerators 34%, large hydroturbines 104%, large electrical machines 15%, steam turbines 12%, and various home appliances from 107 to 349%.

MEETINGS CALENDAR

INTERNATIONAL ELECTROCHEMICAL COMMISSION
50th Anniversary Meeting, University of Pennsylvania, Philadelphia, Sept. 1-16.

***MICHIGAN MUNICIPAL UTILITIES ASSOCIATION**
Fall Conference, Petoskey Mich., Sept. 8-10.

ROCKY MOUNTAIN ELECTRICAL LEAGUE
Annual Fall Convention, Stanley Hotel, Estes Park, Colo., Sept. 12-15.

***ILLUMINATING ENGINEERING SOCIETY**
National Technical Conference, Chalfonte-Haddon Hall, Atlantic City, N. J., Sept. 13-17; Pacific Northwest Region Conference, Harrison Hot Springs, British Columbia, April 25-26, 1955.

INSTRUMENT SOCIETY OF AMERICA
1st International Instrument Congress-Exposition, Philadelphia, Sept. 13-24.

PUBLIC UTILITIES ASSOCIATION OF VIRGINIAS
36th Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., Sept. 16-18.

MISSOURI VALLEY ELECTRIC ASSOCIATION
Accounting Confsrence, Jefferson Hotel, St. Louis, Mo., Sept. 23-24; Sales and Rural Conference, President Hotel, Kansas City, Mo., Oct. 6-8; Industrial and Commercial Sales Conference, President Hotel, Kansas City, Mo., Feb. 3-4, 1955; Engineering Conference, President Hotel, Kansas City, Mo., March 23-25, 1955.

ATOMIC INDUSTRIAL FORUM, INC.
Meeting on "What the New (Atomic) Law Means", Hotel Plaza, New York, Sept. 27-28; Meeting on "Atomic Opportunities in New England", in conjunction with New England Council, Statler Hotel, Boston, Oct. 20.

INSTITUTE OF RADIO ENGINEERS
Professional Group on Industrial Electronics and Pittsburgh Section of IRE, Symposium, Mellon Institute, Pittsburgh, Pa., Sept. 29-30.

INTERNATIONAL ASSOCIATION OF ELECTRICAL LEAGUES
19th Annual Conference, Bellevue-Stratford Hotel, Philadelphia, Sept. 29-Oct. 2.

NATIONAL ELECTRONICS CONFERENCE
10th Annual Conference, Hotel Sherman, Chicago, Oct. 4-6.

NATIONAL ASSOCIATION OF ELECTRICAL DISTRIBUTORS
Pacific Zone Convention, Mark Hopkins Hotel, San Francisco, Oct. 4-7.

INDIANA ELECTRICAL ASSOCIATION
Annual Convention, French Lick Springs Hotel, French Lick, Ind., Oct. 6-8.

INTERSTATE POWER CLUB
Meetings will be held at Hotel Martinique, New York, on following dates: Oct. 11, Dec. 6.

CONTROLLERS INSTITUTE OF AMERICA
Annual Meeting, Edgewater Beach Hotel, Chicago, Oct. 10-13.

***NATIONAL INDUSTRIAL CONFERENCE BOARD**
Third Annual Conference on Atomic Energy in Industry, Hotel Commodore, New York, Oct. 13-15.

NATIONAL SAFETY CONGRESS-EXPOSITION
Conrad Hilton Hotel, Chicago, Oct. 18-22.

OKLAHOMA UTILITIES ASSOCIATION
Electric Light and Power Division, Western District Meeting, Duncan, Okla., Oct. 21; Eastern District Meeting, Ada, Okla., Oct. 22; Annual Convention, Mayo Hotel, Tulsa, Okla., March 24-25, 1955.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS
Annual Convention, La Salle Hotel, Chicago, Nov. 8-12.

AMERICAN STANDARDS ASSOCIATION
36th Annual Meeting and 5th National Conference on Standards, Hotel Roosevelt, New York, Nov. 15-17.

21ST NATIONAL POWER SHOW
Sponsored by American Society of Mechanical Engineers, Commercial Museum, Philadelphia, Dec. 2-7.

EASTERN JOINT COMPUTER CONFERENCE-EXHIBITION
Sponsored jointly by American Institute, of Electrical Engineers, Institute of Radio Engineers, and Association for Computing Machinery; Bellevue-Stratford Hotel, Philadelphia, Dec. 8-10.

***ELECTRICAL EQUIPMENT REPRESENTATIVES ASSOCIATION**
Annual Meeting, Breakers, Palm Beach, Fla., Jan. 10-12, 1955.

NATIONAL ASSOCIATION OF PURCHASING AGENTS
24th Annual Mid-Winter Conference, Public Utility Buyers' Group, Shamrock Hotel, Houston, Tex., Feb. 13-15, 1955.

SOUTHERN SAFETY CONFERENCE-EXPOSITION
Jung Hotel, New Orleans, La., Feb. 27-March 1, 1955.

*Additions this week.

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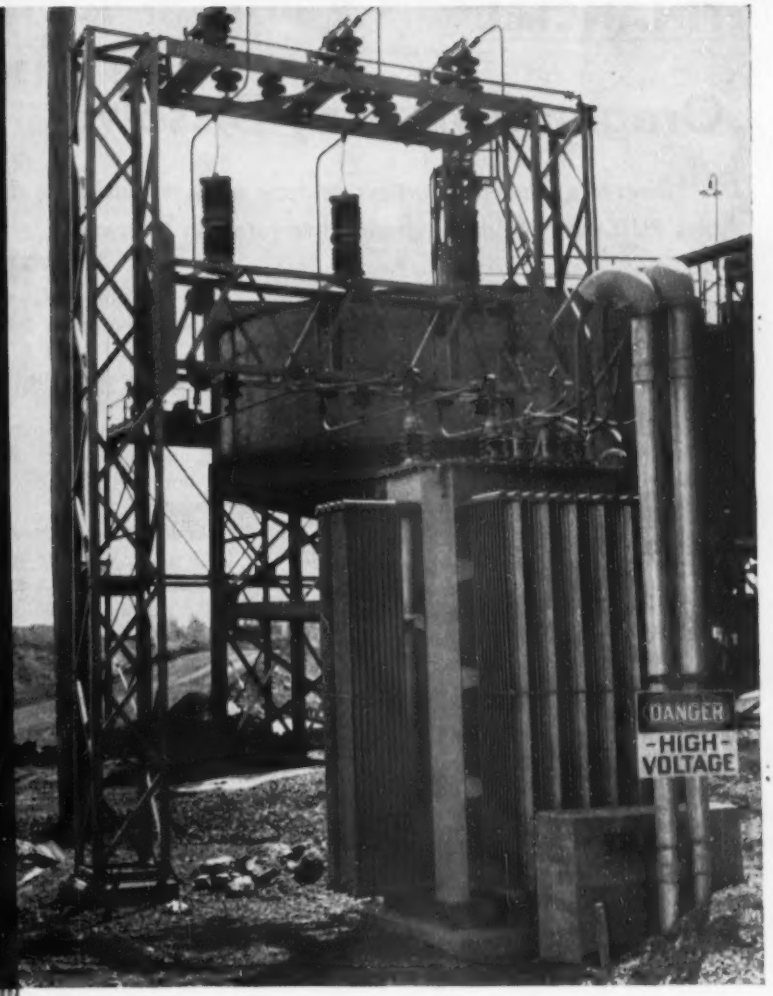
TRANSFORMERS
... the choice of leaders in industry

POWER for a man-sized job...



Taconite is an important word in the Mesabi Iron Country. As the supply of rich ore becomes scarcer, the mining companies are prepared to process taconite and lower grade iron ore for delivery to the nation's steel mills.

Processing taconite is a man-sized job. It is one of the world's hardest ores. It has to be crushed and ground to separate the iron particles from the rock and silica.

During the winter, the temperature in the Mesabi country often drops to 30° below zero. Tough jobs under operating conditions like this call for a plentiful supply of really dependable power. At the Nashwauk, Minnesota, mine of The Cleveland-Cliffs Iron Company, this power is delivered by Wagner Transformers. Shown above is the 3000 kva Wagner Power Transformer that furnishes power for this plant, and at the left is one of the Wagner 1000 kva Unit Substation Transformers that supply plant loads.

Wagner can also furnish motors especially designed for use in taconite plants. Your nearby Wagner engineer can help you select the right transformers or motors for *your* needs. Call the nearest of our 32 branch offices, or write us.

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BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

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754-12

FINANCIAL

Oregon PUD May Dissolve

Directors request attorneys to draw up a resolution to dissolve PUD that would be submitted to voters in November

A motion to request attorneys to draw up a resolution to dissolve Union County, Ore., PUD has been unanimously passed by its board of directors. It was incorrectly reported by Electrical World (Aug. 23, p 89) that the resolution had been passed by the directors. The resolution would be placed on the November election ballot.

Resolution action to dissolve the PUD was prompted by:

1. The second defeat this year of a bond proposal to finance acquisition of California-Pacific Utilities Co's properties in the county;

2. And the fact that the PUD has spent all funds previously raised through taxation to place it in operation.

The proposed $45-million PUD revenue bond issue was rejected in the May primary election and again three months later in a special election. Vote at the first election was 2,588 against the issue and 2,209 for, while at the special election a recount of votes showed the issue was defeated 2,823 to 2,229.

The special election was called by PUD directors who contended that the bond opponents had misrepresented the facts and that the company had taken an improper part in the May election campaign.

Union County PUD was formed in 1940. In 1942 a $925,000 revenue bond was authorized by a narrow margin at the second election on the proposal. This authorization was rescinded by the PUD directors and the $4.5-million bond proposal was submitted to the voters after a district court in 1953 set a value of $3.6 million on the utility property sought by the PUD in a condemnation suit against California-Pacific.

The district's tax authority has expired, and it is out of funds, having spent the $109,000 of extra tax levies that have been collected in previous years.

Faces Hoover Dam Tax Suit

Blark County, Nev., District Attorney Roger Foley is considering filing a law suit in a southern California federal district court to force the City of Los Angeles to pay the 1954 installment of $46,500 on the Hoover Dam power generation tax levied earlier this year by the board of county commissioners.

Payment on the tax came due July 1 and no monies have been received from the southern California municipality which operates the power generation facilities at the Hoover Dam.

It is almost certain that the City of Los Angeles will contest any action by Foley. A lengthy law suit which may end in the appeals court or the U. S. Supreme Court is predicted by local observers.

Foley contends that the county has the right to tax the generation of power while the City of Los Angeles maintains the county is precluded from levying such a tax by the provisions of the Boulder Canyon project act which assertedly appoints the municipality as agent for the federal government.

The matter already has been through the state courts and the county lost. However, Foley says this time the county has a better case to present.

The State of Nevada, through the attorney general's office, is expected to oppose the county's efforts to gain the added tax revenue. This is due to the complicated provisions of the Boulder Canyon act which set aside $300,000 of federal funds for the state.

In effect, if the county were to win the law suit, the money would be deducted from this amount, depriving the state treasury of the $46,500.

The county's power generation tax provides for an 8¢ per kw of generator rating levy for each generating unit being used and operated each fiscal year.

Ohio Power to Acquire Bluffton Power System

The Board of Public Affairs of Bluffton, Ohio, has voted to sell the municipal power system to Ohio Power Co, which submitted the lower of two bids. Ohio Power bid $466,500 for the system, and Hancock-Wood Electric Cooperative, Inc, bid $501,-000.

Reason for selecting the lower bid, the board said, was that the co-op bid contained substantial terms and conditions pertaining to rates not included in the legal notice for sale. Moreover, the board's resolution said an investigation had been made of the co-op's articles of incorporation and it was decided that the Hancock-Wood bid was invalid under state laws. Therefore, it was beyond the authorization of the board to accept the higher of the two bids.

J. P. Luse, an official of the co-op, said his group would not contest the contract award, despite advice by attorneys that the co-op could win a court test of the decision.

Insurance Firms Favor Electric Utility Issues

Largest part of public utility holdings of four life insurance companies are in electric utility stocks and bonds, according to an analysis of these companies having 16½% of the total assets employed in the life insurance business, Edison Electric Institute has revealed.

Electric utility stocks represented 85.8% or $143 million of the $167 million in public utility stocks owned by these insurance companies on Dec. 31, 1953. Of the total 72.2% was preferred and 13.6% common stock.

Electric utility bonds represent 58.4% or $1.2 billion of the group's utility bonds that totaled $2.06 billion.

The four insurance companies have 15.9% of their funds invested in public utility bonds and 1.3% in public utility stocks.

Ebasco's Rate Study On Vepco's Users Due

Virginia's State Corporation Commission expects to receive a study in September from Ebasco Services, Inc, on the new electric rates that went into effect March 1 for customers of Virginia Electric & Power Co, Commissioner H. Lester Hooker has announced.

The commission hired the engineering firm to determine whether the new rates are equitably distributed among various classifications of customers. Residential bills were increased 55¢ monthly and charges for other types of service were changed under the new rates.

Hooker explained that, on the basis of the report, the commission could revise rates in specific classifications, either after further public hearing or in conference with Vepco officials.

FINANCIAL BRIEFS

Pacific Power & Light Co has asked FPC approval to issue a maximum of 32,047 common shares which will be sold under an employees' stock purchase plan . . . **Manila Electric Co,** American owned, has offered $4 million of 15-year 6% debentures due 1969 to the public.

Rockland Light & Power Co has sold $7 million 3½% debentures due in 1974 to institutions through First Boston Corp. The company has Federal Power Commission approval to acquire 10,500 common shares from its subsidiary Rockland Electric Co.

Northwestern Utilities Ltd, Edmunton, Canada, has sold 30,000 shares of $100 par, 4% cumulative preference stock to a syndicate headed by Nesbit, Thomson & Co, Montreal. This group is offering the stock to the public at $92 a share to yield 4.35%.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
Aug. 19	**2.85**	**2.90**	**3.11**	**3.95**	**4.06**	**4.42**	**4.48**	**4.74**	**5.03**
Aug. 12	2.85	2.90	3.11	3.97	4.07	4.42	4.44	4.70	5.05
END OF QTR.									
2nd 1954	2.90	2.96	3.19	4.03	4.14	4.48	4.72	5.04	5.45
1st 1954	2.82	2.87	3.14	3.88	4.09	4.42	4.83	5.19	5.42
4th 1953	3.07	3.12	3.34	4.17	4.32	4.62	5.07	5.57	5.51
3rd 1953	3.30	3.33	3.54	4.35	4.52	4.83	5.36	5.57	6.01

Data: Reis & Chandler, Inc.

EARNINGS

Company	Period Months	Ended	Net Income 1954	Net Income 1953	Earnings Per Common Share 1954	Earnings Per Common Share 1953
California Electric Power	12	June	$2,702,278	$2,632,066	$.86(a)	$.82(a)
Carolina Power & Light	12	July	7,686,083	7,202,449	.....	.....
Cincinnati Gas & Electric, consolidated	12	June	12,022,483	10,672,548	1.63(b)	1.49(b)
Cleveland Electric Illuminating	12	June	14,670,054	13,752,400	4.04	3.77
Citizens Utilities	12	June	957,000	831,000	1.05(c)	.92(c)
Detroit Edison	12	July	21,069,147	20,278,525	1.95(f)	1.92(f)
Duquesne Light, consolidated	12	June	15,934,583	14,622,223	2.30(g)	2.17(g)
General Public Utilities, all subsidiaries	12	June	22,212,287	19,381,090	2.31(h)	2.02(h)
Minnesota Power & Light	12	July	3,690,930	3,951,534	1.81(i)	1.96(i)
New York State Electric & Gas	12	July	9,598,770	8,292,954	2.67(j)	2.61(j)
Pennsylvania Water & Power	6	June	640,183	664,908	1.10	1.16
Public Service Co of Colorado	12	June	7,950,198	7,718,304	2.36(k)	2.34(k)

Notes—(a) Based on shares outstanding at end of period; (b) Based on 6,700,050 shares in 1954 and 6,405,000 shares in 1953; (c) Based on 907,196 shares outstanding in 1954; (f) Based on 10,778,843 shares in 1954 and 10,584,888 shares in 1953; (g) Based on 6,150,000 shares in 1954 and 6,000,000 shares in 1953; (h) Based on 9,609,410 shares presently outstanding; (i) Based on 1,716,094 shares in 1954; (j) Based on 3,034,068 shares in 1954 and 2,696,950 shares in 1953; (k) Based on 2,754,639 shares in 1954 and 1953.

FINANCING

Company and Description	Amount of Offering (000)	Offering Price	Yield to Public
WEEK OF AUGUST 19–25			
Bonds			
Niagara Mohawk Power—gen mtg 3¼% due 1984	$25,000	102.26%	3.01%
Arkansas Power & Light—1st mtg 3¼% due 1984	7,500	101.931	3.15
Lower Colorado Power Authority, Tex.—revenue refunding due 1955–62	27,000	various	0.75–2.15
Preferred Stock			
Northern States Power—200,000 sh $4.11 $100 par	$20,000	101.732	4.04%
SCHEDULED FOR SEPTEMBER—OCTOBER			**Bid Date**
Bonds and Debentures			
Los Angeles, Calif., Department of Water and Power—electric revenues due 1955–84	$19,500	.....	Sept. 8
Montana-Dakota Utilities—1st mtg due 1979	5,000	.....	Sept. 8
Montana-Dakota Utilities—1st mtg due 1956–75	7,000	.....	Sept. 8
Dayton Power & Light—1st mtg due 1984	15,000	.....	Sept. 23
Northern States Power (Minn.)—1st mtg due 1984	20,000	.....	Sept. 28
Vineland, N. J.—electric plant due 1955–74	3,500	.....	Sept. 28
Public Service Co of Colorado—1st mtg due 1984	20,000	.....	Oct. 4
Columbus & Southern Ohio Electric—1st mtg	10,000	.....	Oct. 5
Indiana & Michgan Electric— 1st mtg	16,500	.....	Oct. 5
Wisconsin Power & Light—1st mtg	18,000	.....	Oct. 5
Sierra Pacific Power—1st mtg	4,000	.....	Oct. 8
Savannah Electric Power—1st mtg	5,000	.....	Oct. 26
Savannah Electric Power—debs	3,000	.....	Oct. 26
Cleveland, Ohio—electric revenues	5,000	.....	.....
Preferred Stock			
Oklahoma Gas & Electric—75,000 sh. $100 par	$7,500	.....	Sept. 14
Tampa Electric—50,000 sh $100 par	5,000	.....	Sept. 22
Indiana & Michigan Electric—40,000 sh $100 par	4,000	.....	Oct. 5
Savannah Electric & Power—30,000 shs $100 par	3,000	.....	Oct. 26
Common Stock			
California Electric Power—170,000 sh	.....	.....	Aug. 31
Columbus & Southern Ohio Electric—200,000 shs	.....	.....	Sept. 20(b)
New England Electric System—910,883 sh (to be offered commonholders on 1-for-10 basis, record Sept. 29)	.....	.....	.....
San Diego Gas & Electric—800,000 sh	.....	.....	.....
Sierra Pacific Power—34,807 shs (to be offered commonholders, record about Oct. 1 to expire Oct. 22)	.....	.....	.....
ISSUES RECENTLY POSTPONED			
Bonds			
Gulf States Utilities—1st mtg due 1984	$24,000	.....	.....
Consolidated Edison Co of N. Y.—1st mtg due 1984	50,000	.....	.....
Preferred Stock			
California Electric Power—105,000 sh $50 par	$5,250	.....	.....(a)

Notes—(a) Temporarily postponed; Merrill Lynch, Pierce, Fenner & Beane group, underwriters; and (b) Dillon, Read & Co, Inc, group, underwriters.

Cleveland Electric Gets Rate Hike

- **Ohio PUC permits a $4.2 million yearly increase, instead of $5.2 million requested**
- **Commission's decision is based on reproduction cost new less depreciation for the test year of operations ended December, 1953.**
- **Order provides a 4.78% return on actual 1953 expenses on a base of $386 million**

Cleveland Electric Illuminating Co has received a $4.2 million a year rate increase in accordance with an order dated July 22 by the Ohio Public Utilities Commission. This compares with $5.2 million requested by the company.

The order stated that "on Feb. 11, 1954, the Cleveland Electric Illuminating Co filed with the commission a duly verified application seeking authority to amend and to increase its filed schedules fixing rates and charges for electric service throughout its service area, to be effective on and after Aug. 9, 1954. The proceeding was filed pursuant to Section 4909.18 of the Revised Code, and all the exhibits required by that section or by order of the commission were duly filed.

"All procedural requirements with respect to notice of the filing have been complied with."

The order continued: "The hearings were concluded on June 30, 1954 and the evidence taken before the attorney examiner has been considered by the commission.

"The company is an Ohio corporation engaged in the business of generating and supplying electric energy to consumers within the state and is a public utility.

Allowance made for working capital

"By order of the commission entered on Feb. 18, 1954, the date certain for valuation purposes was set as Dec. 31, 1953, and the year ended Dec. 31, 1953, was fixed as the test year for operations.

"The company's electric rate base is found to be $386 million. This rate base consists of reproduction cost new less depreciation of electric property used and useful in the amount of $363,649,483; work in progress in the amount of $773,532; total land and land rights used and useful for electric service in the amount of $11,349,791; and working capital applicable to electric property in amount of $20,911,000. In arriving at rate base there was deducted from summation of the foregoing items $10,684,000 which is the maximum amount available for investment in working capital in accordance with City of Cincinnati vs P.U.C.O. 161 O.S. 395. This amount has been deducted even though the evidence indicated that it was not invested in property included in the rate base.

"Under the rates proposed in the company's amendment to its application the rate of return on the rate base of $386 million would have been 4.78%, based on 1953 actual expenses, and 4.79% based on 1953 expenses annualized to the levels obtaining at the latest practicable date prior to the hearing.

"We find that the rate of return to be earned under the proposed rates, as hereinabove found, is not in excess of a fair and reasonable rate of return.

"We find that the rates and charges and other provisions of the schedules proposed in the application of the company as amended are just and reasonable, with due regard among other things, to the value of the property of the company actually used and useful for the convenience of the public, excluding therefrom the value of any franchise or right to own, operate or enjoy the same in excess of the amount (exclusive of any tax or annual charge) actually paid to any political subdivision of the state or county as the consideration of the grant of such franchise or right; and exclusive of any value added thereto by reason of a monopoly or merger and to the necessity of making reservation out of the income for surplus depreciation, and contingencies and the same should be substituted for the existing schedules complained of in this proceeding.

Rates to become effective February, 1955

"We find that the rates and charges and other provisions of the schedules proposed in the company's application as amended are not discriminatory.

"In our opinion for the reasons given above, the changes of rates and schedules proposed in the application as amended should be, and the same hereby are, approved.

"It is, therefore ORDERED, That the new schedules of rates proposed in the company's application as amended shall be made effective with service rendered from and after the 9th day of February, 1955; . . ."

Hawaiian Electric Asks for 11% Rate Increase

The Hawaiian Electric Co in Honolulu, T. H., now is petitioning for its second boost in two years.

In January, 1953, after requesting a 12% increase in rates, the Hawaii Public Utilities Commission granted one of roughly 7%. HECo said it was "disappointed."

Its newest petition asks for increases of approximately 11% average, effective next January, "to keep pace with the rise in costs of operation and maintenance and the company's extensive expansion program."

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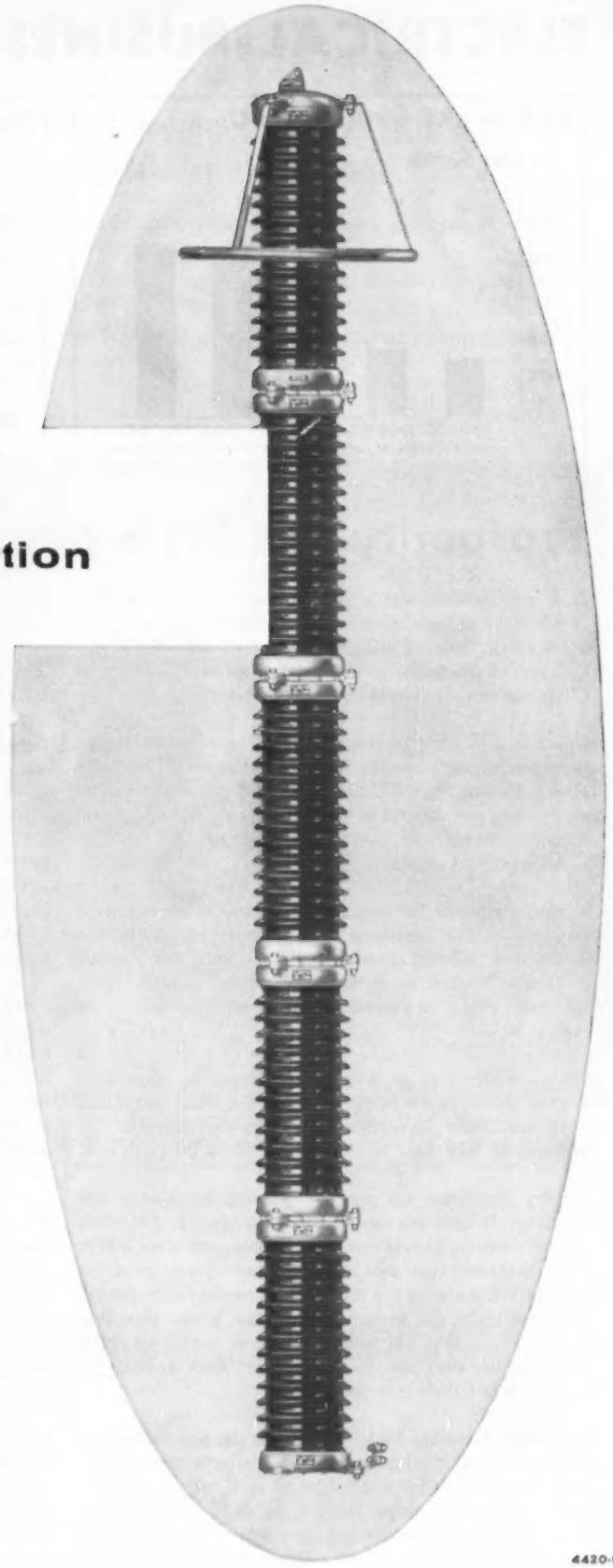

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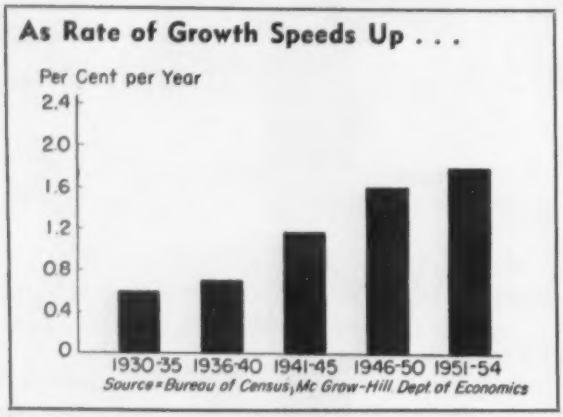

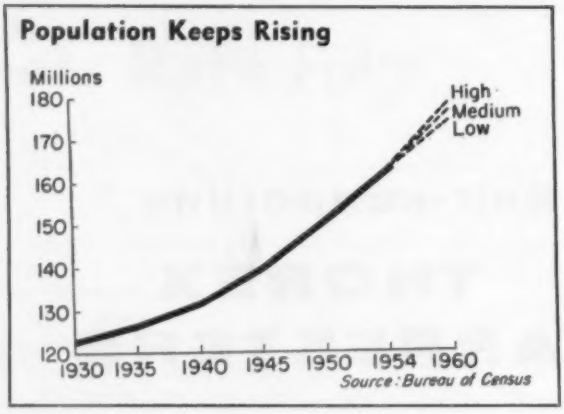

Prosperity and Style Boost Population

U. S. population is still growing fast—faster, in fact, than at almost any time in the past twenty years. This rapid expansion in the most basic of all economic factors—people—is one of the brightest economic signs for the future of U. S. business, including the power business.

In some countries, population is a curse—more people mean simply more mouths to feed. But so far, at least, it's been a blessing for the United States. A growing economy needs those new mouths to keep its markets expanding, and it needs new pairs of hands to increase production in the factories.

Population growth has long since confounded the economic prophets of the 'thirties—who thought that population would level off and even decline long before it reached its present level of more than 162 million. And it is still surprising plenty of experts today, by refusing to level off even a little.

There are plenty of good reasons for expecting population to grow slower in the current period. The chief one is that there are fewer unmarried people of marriageable age available to take their vows and help boost the birth rate.

But the population has gone on growing, in spite of this handicap. In fact, the most recent year (July 1, 1953-July 1, 1954) saw the fastest increase in population since before 1930, excepting only two earlier postwar years. And the most recent years, as a group, have shown a faster growth rate than even the immediate postwar years. (See first chart). Population has been growing at a rate of about 1.75% a year since the middle of 1950. Back in 1930-35, the rate was 0.66% per year.

Population Growing Fast . . . Why is the population still growing so fast? Certainly there are a large number of factors. One that is often overlooked is a matter of style. Today, it's popular—the "thing to do"—for young women to be married early in life and have a lot of children. Not long ago, the ideal was to be a career girl, or an "emancipated woman," and that certainly helped cut down the birth rate.

This factor is probably especially important in the more educated groups in the population. Many college graduates used to have one or two children—if any—and then stop. Now young people get out of school, get married, and frequently proceed to have three or four kids. Sometimes the children are even born while their father is in college.

But perhaps the biggest factor in maintaining population growth is prosperity. The fact that everyone can get a job, and increase his income fairly rapidly, means that people can afford to be married young, and they can afford to have a lot of children. They have been taking advantage of the opportunity in droves.

Postwar prosperity has also helped young couples by making homes, automobiles, and appliances available to them on very easy terms; they don't necessarily have to wait and save up a lot of money before having all the comforts of home. And prosperity has helped cut the mortality rate, by giving people enough healthy food, and prompt medical attention—things many people could not afford in the 'thirties.

The Key—Prosperity . . . This factor of prosperity may hold the key to future population growth in the United States. It seems likely to the experts that the rate of growth will slow down for a while—just because fewer people were born in the 'thirties, so there won't be so many getting married and having new families in the 'fifties. The Census Bureau's estimates for 1960 (second chart) all assume that this will happen.

But, even if it does, there's still a wide range of possibilities for population growth. And the degree of prosperity we enjoy will be a major factor in deciding which one works out. If the nation is prosperous through most of the next few years, birth rates will probably stay high. If it's not, they may drop.

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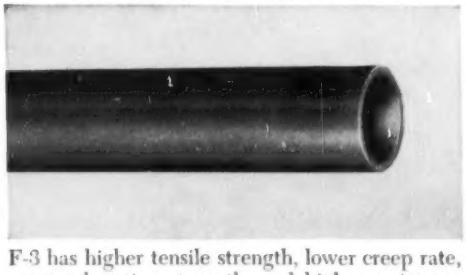

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